SONY®

SERVICE MANUAL

AVC-3420CE

VIDEO CAMERA

SONY CORPORATION

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X-RAY RADIATION WARNING

BE SURE THAT PARTS REPLACEMENT IN THE HIGH VOLTAGE BLOCK AND ADJUSTMENTS MADE TO THE HIGH VOLTAGE CIRCUITS ARE CARRIED OUT PRECISELY IN ACCONDANCE WITH THE PROCEDURES GIVEN IN THIS MANUAL.

SECTION 1
GENERAL DESCRIPTION

1-1. INTRODUCTION

The Model AVC-3420CE represents an outstanding engineering achievement. This Camera is designed especially for use with the SONY AV-3420CE Videocorder.

Camera operation is extremely simple; the operator need only aim the camera and adjust optical focus. Automatic sensitivity control maintains a constant video output over a wide range of light values.

The operating temperature range is from 0°C to 40°C. Within this range, free-running horizontal sweep frequency changes less than 1% and vertical frequency, focus, linearity and video output reremains unchanged. Clean, high-resolution pictures are assured by a unique video amplifier system and special low-noise SONY transistors.

A built-in viewfinder employs a 1″ picture tube to display camera output directly. This feature permits parallax-free framing and perfect optical focus and zoom adjustments.

Also, this camera employs the newly developed Electret Condenser Microphone, in which a special, high-polymer film is used for the diaphragm. This permits a high sensitivity and high fidelity audio recording.

1-2. SPECIFICATIONS

Camera tube:	2/3″ separate mesh vidicon 8844/8823 or M7075
Semiconductors:	40 transistors plus 21 diodes
Scanning system:	625 lines, 50 fields per sec. with 2 : 1 interlace, when supplied with sync signals from the AV-3420CE Videocorder
Standard lens:	VCL-1206 Zoom type, F1.8, 12.5 ~ 75 mm "C" mount
Horizontal resolution:	More than 400 lines
Horizontal frequency:	15,625 Hz
Vertical frequency:	50 Hz
Signal-to-noise ratio:	Greater than 40 dB
Video output:	1.0 V(p-p), sync negative, load impedance 50 ohms
Automatic sensitivity:	300 lux to near infinity (with F1.8 lens)
Power consumption:	8 watts
Power requirements:	DC 12 V supplied by the AV-3420CE
Dimensions:	71.4 mm (W)(BOTTOM) 63.5 mm (W)(TOP) 12.7 mm (H) 215.9 mm (L)
Weight:	2.72 kg (With zoom lens)

1-3. OPERATION (with SONY AV-3420CE Videocorder)

Step 1. Connect the end of the camera cable to the receptacle on the side of the Videocorder. Lock the connector into place by tightening the locking collar on the cable connector.

Step 2. Set the CAMERA/TV switch on the Videocorder to [CAMERA].

Step 3. Set the Function Levers on the top of the Videocorder to the REC and FWD positions simultaneously. You will hear the motor start. In a few moments the raster should appear on the screen of the monitor (behind the eyepiece).

Step 4. Remove the lens cap and point the camera at the subject. Adjust the zoom lever for the desired subject coverage and adjust the optical focus ring for a sharp picture.

> **Note:** In most cases, set the lens opening to maximum (F2). Step down the lens only when operating in bright outdoors or under studio-type lighting conditions. Make sure that the picture is satisfactory before actual recordings are started.

Step 5. Start the recording by pulling the start button or grip switch of the camera. A red light mounted behind the eyepiece lights to show the operator that the recording is in progress.

Step 6. The audio part of the recording can be monitored by plugging the earphone into the jack marked EARPHONE on the top of the Videocorder.

Step 7. To stop the recording, pull the start button again or the grip switch. Set the Function Lever to STOP to shut off the system.

Note: Observe the following when operating the AV-3420CE from storage batteries.

1. Monitor battery condition to make sure that the batteries are not discharged too deeply. The battery meter on the top of the Videocorder shows battery conditions under load. Do not use the system when the meter reads in the red zone.
2. A drop in battery voltage below 11 volts will result in a loss of electrical focus in the viewfinder. This symptom signals low battery voltage. Do not continue to drain the batteries beyond this point as the ability of the batteries to be recharged will be impaired.

Step 8. To playback the tape, rewind the tape and set the Function Lever of Videocorder to FWD. The playback picture can be seen on AVC-3420CE Viewfinder.

Operation with the CMA-3CE

The CMA-3CE permits the AVC-3420CE camera to be operated with one of the decks in the AV and CV series. Attach the CMA-3CE to the Videocorder as shown in the CMA-3CE operating instruction. Proceed as follows.

Step 1. Connect the end of the cable to the mating connector on the CMA-3CE.

Step 2. Plug the AC cord of the CMA-3CE into one of the AC outlets on the rear jackplate of the Videocorder. Plug the mini jack into the MIC. IN jack and plug the 6-pin connector into the CAMERA jack on the Videocorder.

Step 3. Turn on the power switch on the CMA-3CE. Set the HD SELECT switch to [~].

Step 4. The picture should appear in the screen of the viewfinder in a few moments.

Step 5. Follow the regular operating procedure for the deck to make the recording. (The red lamp in the viewfinder does not operate when the camera is used with the CMA-3CE).

OPERATING PRECAUTIONS.

To protect the vidicon:

1. Avoid mechanical shock to the camera.
2. Do not carry the camera with the lens pointing downwards. In particular, avoid mechanical shock to the camera when the lens is pointing downwards.
3. Never point the camera at the sun or at another source of intense light. Keep the lens stopped down when shooting brightly illuminated scenes. Do not allow brightly illuminated scenes to remain stationary on the screen. Move the camera from side-to-side occasionally to keep images from being "burned in" at the target.

To protect the built-in microphone:

4. Do not keep the camera in an ambient temperature of over 60°C.
5. Keep the camera away from solvents, adhesives, and some plastics such as soft vinyl, vinyl acetate or other plastics containing plasticizers.

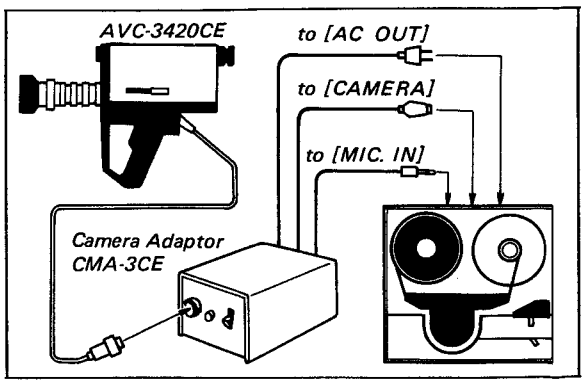


Fig. 1-1. AVC-3420CE with CMA-3CE

1-4. REMOTE CONTROL

The record mode can be started and stopped in the AV-3420CE by means of the remote control button on the front of the AVC-3420CE camera. Use this button directly whenever the camera is mounted on a tripod or the monopod. When the handgrip is in place, the button is actuated by the trigger on the handgrip. Remote control action is self locking; the button is held down for the duration of the recording. Recording stops when the button is pulled again.

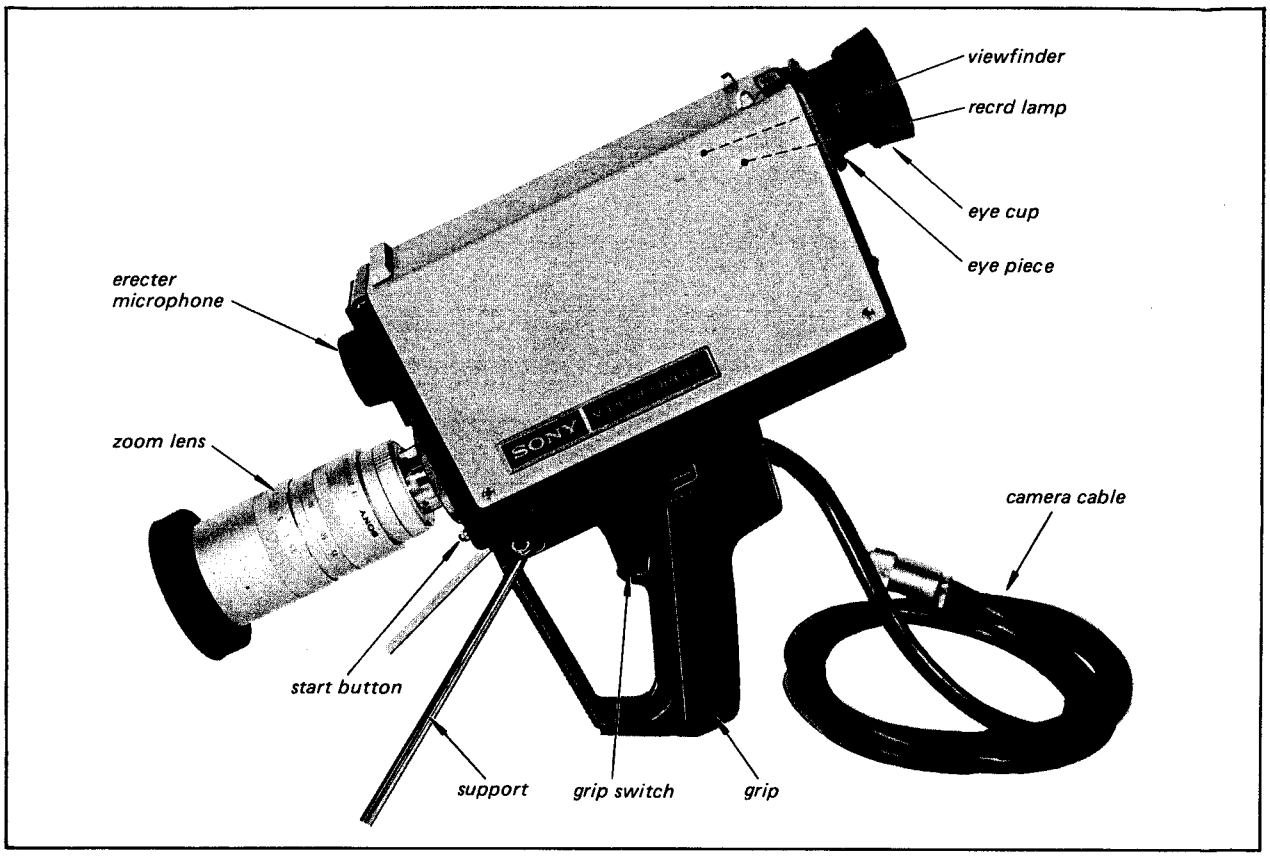


Fig. 1-2. AVC-3420CE

1-5. CONNECTIONS

Figure 1-3 shows the signals carried by the camera cable.

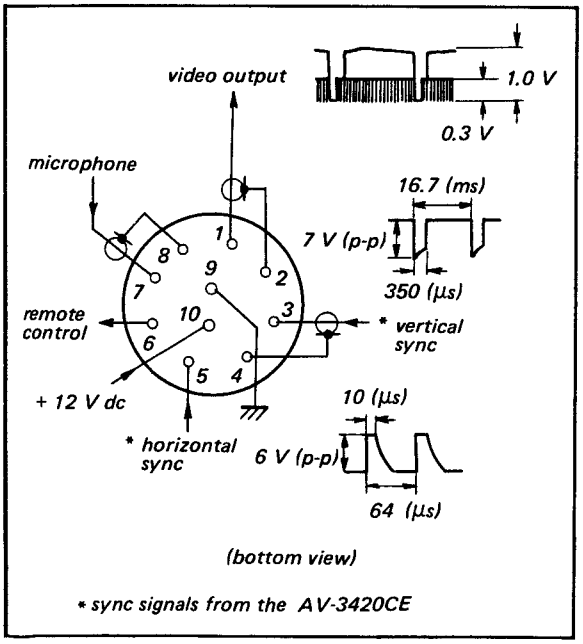


Fig. 1-3. Input and output signals at the 10-pin connector

SECTION 2
CIRCUIT DESCRIPTION

2-1. GENERAL INFORMATION

The AVC-3420CE uses four printed circuit boards. If you hold the camera with the lens facing you, the Video board "P" is mounted in a shield box above the vidicon near the front, the Deflection board "D" is at the left, the Power board "H" is at the right rear, and the Mic board "M" at the right front. See Fig. 2-1. The vidicon is mounted inside a coil assembly behind the lens mount. The picture tube for the viewfinder is mounted above the chassis, to the right. The microphone is mounted on the upper portion of the front panel.

The camera receives its power (12 V dc) from the AV-3420CE Videocorder (or the CMA-3CE adaptor). The camera's picture should appear on the screen of the viewfinder within a few minutes of the application of power. The eyepiece on the viewfinder is adjustable (slides in and out) to suit the operator's optical requirements.

Video output from the vidicon is obtained from a spring connector that contacts the target ring at the lens end of the vidicon. This signal is routed directly to the Video board where the signal is amplified. Further signal processing occurs in the Deflection board and the output signal is sent to the Videocorder and the viewfinder.

Beam intensity is controlled by a screwdriver adjustment that controls bias on the vidicon. Spot focus is adjusted by the varying of the G3 voltage in the vidicon; current in the focus coil is regulated but not adjustable in this camera.

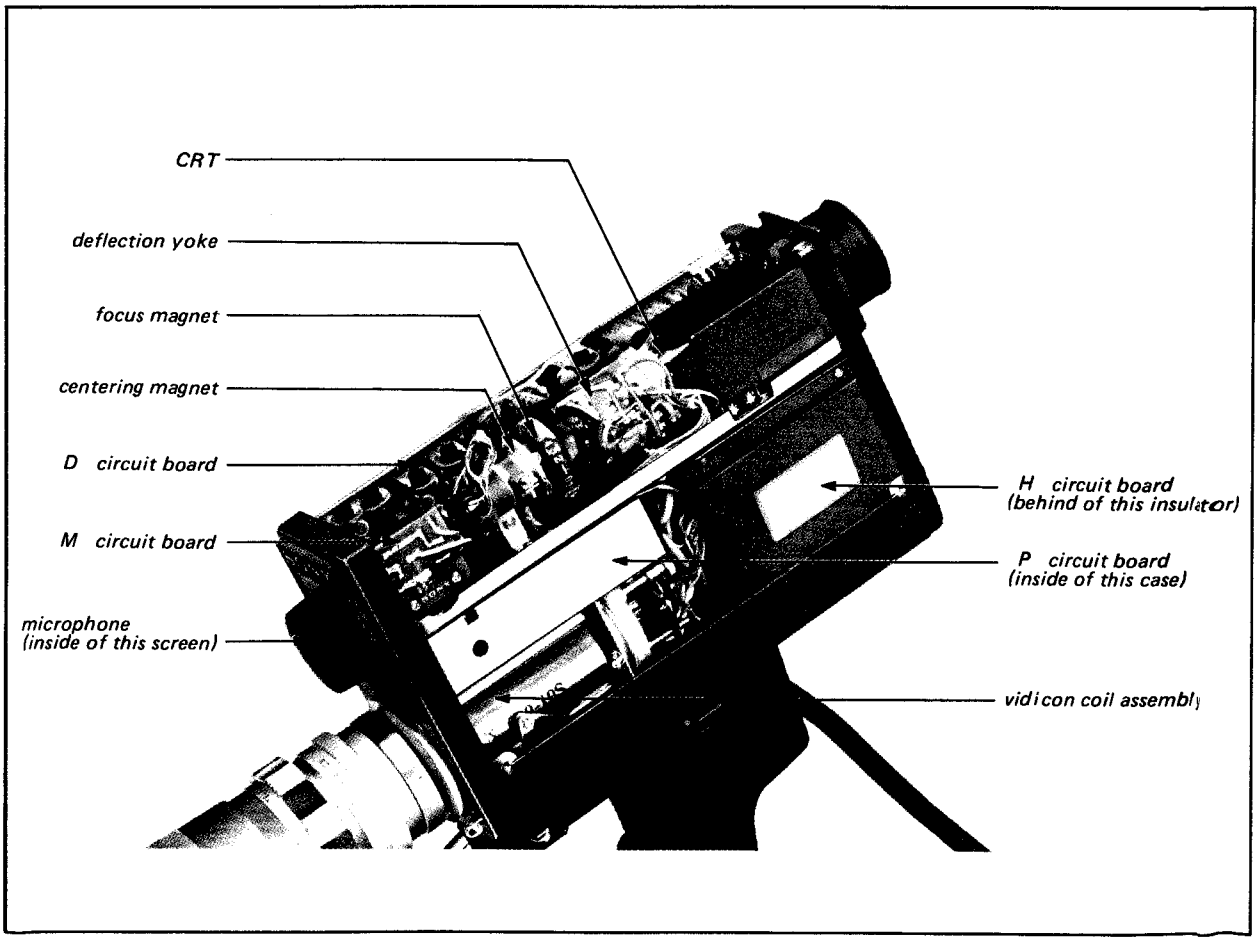


Fig. 2-1. Major parts location

The Deflection board contains the deflection circuits for both the vidicon and the viewfinder as well as a regulated 9-volt supply. In addition, it contains the sync and blanking circuits, the vidicon-heater supply and the circuits that add sync to the composite video signal. The deflection oscillators are normally free running.

The power board contains a high-voltage convertor that is drived by 15.625kHz deflection signals and operates at half that frequency. This convertor supplies the operating potentials for the vidicon as well as the high voltage (3 kV) for the viewfinder.

2-2. THE VIDICON

Vidicons are used in most closed-circuit TV cameras. Their small size, simplicity and ruggedness makes them ideal for closed-circuit work. All vidicons make use of the same principles of operation. They differ primarily in size, sensitivity, resolution, and spectral response.

The light-sensitive element of the vidicon is the target. See Fig. 2-2. It consists of a transparent conducting film on the inner surface of the faceplate, and a photoconducting layer immediately behind it (electron-gun side). The photoconducting layer changes resistance in inverse proportion to the light falling on the target. That is, a bright spot in the target results in a drop in resistance and a higher output current when the beam sweeps across this spot.

The vidicon used in the AVC-3420CE is extremely small, measuring only 2/3 inch in diameter at the target ring and 10 cm in length. The mesh is isolated from G3 and is operated at a higher potential. This results in an improvement in resolution. Shading, image persistence and flicker are also greatly reduced.

Grid G1 is the control grid. It operates with a bias voltage of about −30 volts to control beam current. G2 the accelerator-focus electrode, operates at a fixed potential of about 300 volts. Focus is controlled by the electrostatic lens between G2 and G3.

The G3 voltage is adjustable and operates at about 260 volts. The mesh, G4 operates at a fixed 400 volts.

2-3. VIDEO CIRCUITS

The video preamplifier and ASC sections are mounted on the shielded P board. Further processing, black-level clamping and sync insertion takes place in the D board. Refer to the block diagram on page 2-3 and the schematic diagram in Section 4.

Video output from the vidicon is developed

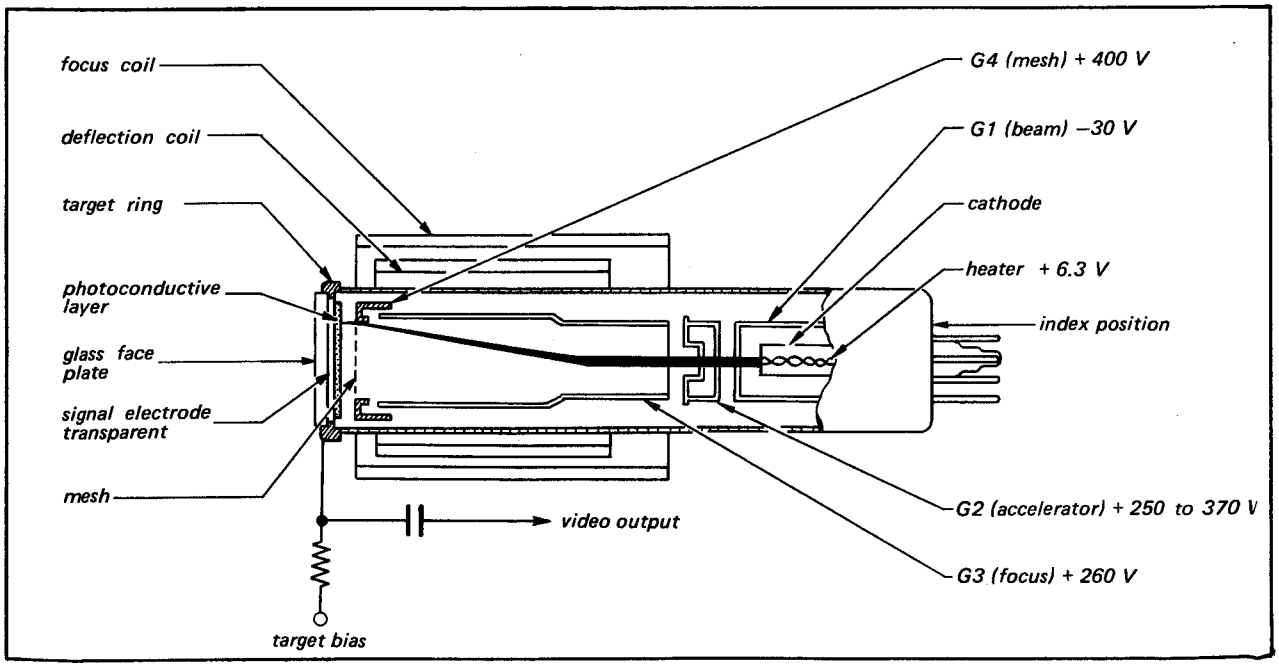


Fig. 2-2. Vidicon 8844/8823

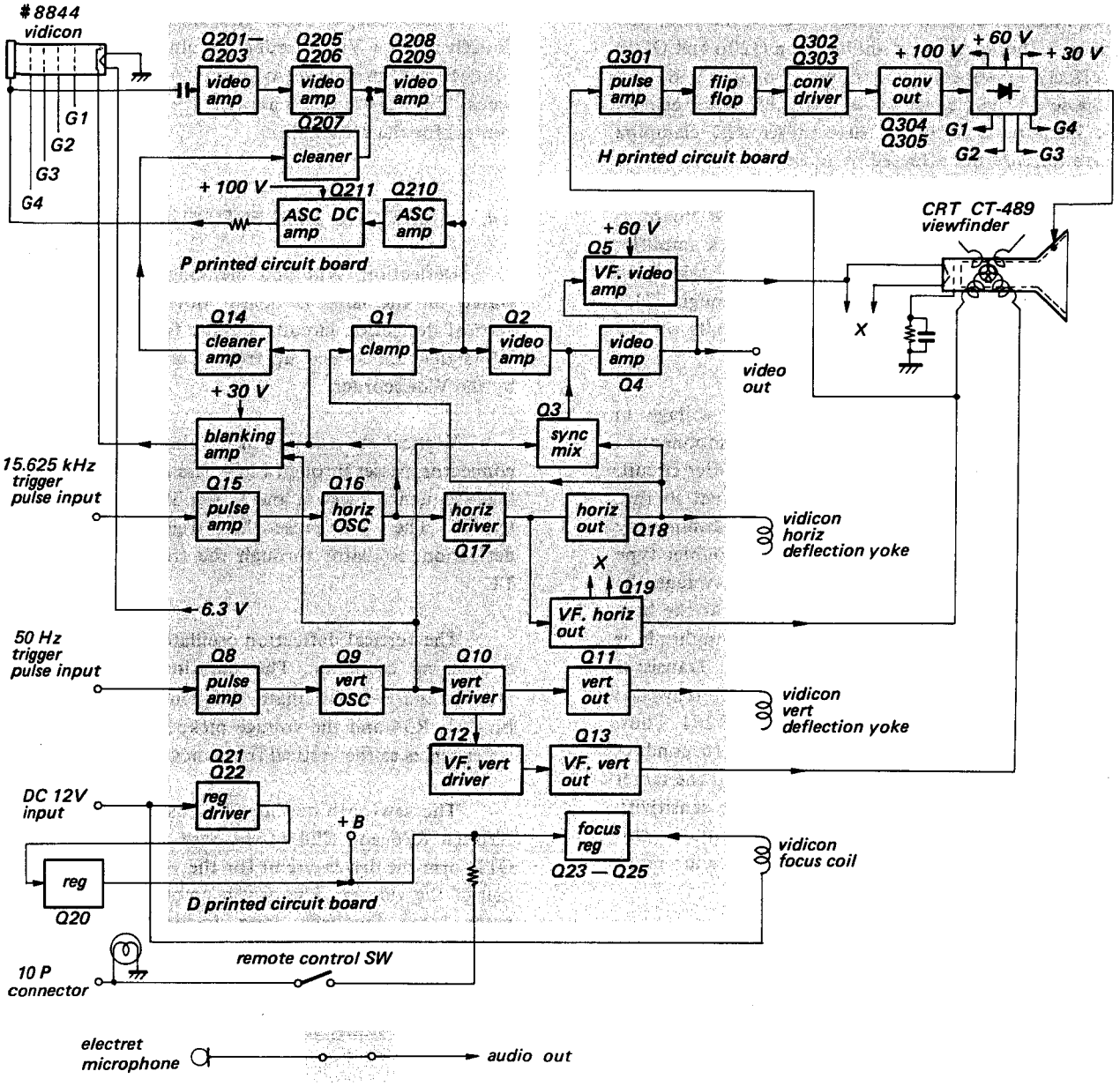


Fig. 2-3. System block diagram , AVC-3420CE

across the load resistor R201, and coupled to Q201 through a pi-type network formed of the lead and target capacitance, L201 and the input capacitance of Q201. Capacitor C201 serves to block DC. The input circuit extends high frequency response, but rolls off at higher frequencies (over 8 MHz) to eliminate very high-frequency noise. L501 and C501 eliminate VHF/UHF signals picked up by the target lead.

Transistors Q201, 202 and 203 form the first feedback amplifier group. Direct coupling is employed between stages with negative feedback applied from the collector circuit of Q203 to the base of Q201. Emitter peaking is employed in the Q202, Q203 circuits; C210 and C208 are the peaking capacitors.

Transistors Q205 and Q206 form the second feedback group. It also employs direct coupling. A loop containing the coil L202 provides a form of aperture correction.

The coupling circuit between Q206 and Q208 contains the "cleaner" switch Q207. This transistor is driven into saturation by positive pulses obtained from

the horizontal deflection system. During the saturated intervals, the coupling circuit between Q206 and Q208 is effectively shorted to ground through C216. The purpose of the cleaner pulse is to eliminate noise on the blanking pedestal so that subsequent clamping operations are not affected by noise.

Final video amplification on the P board is accomplished by Q208 and Q209, a feedback amplifier group. Output from the collector of Q209 takes two paths. One feed is to the ASC system through C219. The other is to the remaining video circuits on the D board via C1.

The ASC system controls target voltage in inverse proportion to the average white component of the signal. Transistor Q210 drives the rectifier circuit. D201 clips the blanking part of the signal so that the signal presented to the rectifier is predominantly video. D202 and D203 form a voltage-doubler type rectifier. The filter C223 is designed to average the output of the rectifier so that the signal at the base of Q211 is a positive dc voltage whose amplitude is proportional to the average white level. Transistor Q211 is a dc amplifier. Its collector voltage is applied to the vidicon target through R202 and R201. Thus, an increase in white level causes Q211 to conduct more heavily and its collector voltage (and the target voltage) decreases. This in turn lowers the sensitivity of the vidicon and reduces video output. In this way video output is held constant over a wide range of light values.

Note that the emitter of Q211 is returned to a positive voltage picked off at the junction of R239 and R240. This prevents Q211 from conducting until the output of the rectifier exceeds the emitter voltage. Thus, ASC action is "delayed" or disabled at very low values of light input to the vidicon.

The remaining video circuits operate as follows. The coupling circuit between the preamplifier section and Q2 on the D board contains a keyed clamped circuit Q1. The clamp is driven into saturation by horizontal sync pulses from T5, and clamps the blanking pulses of the video signal to the voltage picked off at the junction of R2 and R3. The clamped video signal is then dc coupled through the emitter follower Q2 to the video output stage Q4. Horizontal and vertical sync is inserted in the base circuit of Q4 by the sync mixer Q3. The mixer combines positive horizontal and vertical sync pulses, inverts them, and adds them to the video developed across R4. The diode D1 prevents horizontal sync pulses from feeding into the vertical oscillator section.

Video output from the emitter of Q4 feeds directly to the Videocorder via pin 1 of the camera connector. A variable video output from the arm of R9 feeds the viewfinder circuits; R9 is the contrast control for the viewfinder.

2-4. VERTICAL DEFLECTION CIRCUITS

Deflection, sync and blanking circuits are generated on the large D board. Both horizontal and vertical deflection circuits employ free-running oscillators that are locked up from sync pulses delivered by the Videocorder.

Vertical sync comes in on pin 3 of the camera connector, passes through a low pass filter to eliminate high-frequency pickup, and is amplified and inverted by Q8. The sync pulse then triggers the vertical deflection oscillator through the trigger winding on T1.

The vertical deflection oscillator Q9 operates as a blocking oscillator. The duration of the cut-off interval and hence oscillator frequency, is determined by C21, R34 and the voltage picked off at R32. The latter serves as the vertical frequency control.

The sawtooth developed across C22 is coupled through R36 and C24 to the base of Q10. Q10 and Q11 form the driver circuit for the vertical deflection coil of the vidicon. The drivers employ two feedback paths. One feedback loop includes the vertical linearity control R43. The other loop is formed by returning the cold side of the deflection coil through C28 to the emitter circuit of Q10. The amount of feedback is controlled by R41, the height control.

The amount of dc current flowing in the vertical deflection coil, and therefore vertical beam alignment, is determined by the setting of R51.

Sawtooth waveforms developed at the emitter of Q10 are also routed to the vertical deflection system of the viewfinder via R52. Vertical drive for the sync mixer and the blanking generator is taken at the collector of the deflection oscillator Q9.

2-5. HORIZONTAL DEFLECTION CIRCUITS

Horizontal sync enters the camera at pin 5 of the camera connector and is amplified and inverted by Q15. The amplified pulse is then applied to the base of Q16 the horizontal blocking oscillator. Operation

of this oscillator is similar to that of Q9 except for the shorter time constants involved. In addition, Q16 provides a pulse output at the tertiary winding of T3 instead of a sawtooth output.

Transistor Q17 acts as a buffer to prevent the horizontal output stage from loading the horizontal oscillator. The drive signal from Q17 acts to cut off the horizontal output transistor Q18 during retrace. The damper diode D7 provides the early part of the deflection waveform and Q18 comes into conduction to provide the remaining part of the trace. Deflection current is regulated by a series inductance T6 which serves as the width control. Direct current in the deflection coil is controlled by R84 to provide horizontal beam alignment control.

The horizontal deflection system also serves as the source of signal for the following sub systems. A negative pulse from the emitter of Q16 feeds the cleaner amplifier Q14 and the input to the blanking mixer through C18. The driver transformer supplies drive to the horizontal output transistor for the viewfinder, Q19. The flyback pulse at the collector of Q19 also supplies drive to the high-voltage convertor via R301 and C301. A positive pulse from the secondary winding on T5 feeds both the keyed clamp Q1 and the sync mixer Q3.

2-6. BLANKING CIRCUITS

Blanking pulses at 50 Hz and 15.625 kHz are applied to the cathode of the vidicon to blank output during the retrace intervals. Vertical pulses are coupled from the collector of the vertical oscillator to the blanking amplifier Q6 via C12. The inverted pulse is integrated by C13 to prolong the pulse and widen the blanking pulse. D3 clips the positive excursion and shapes the wave before it is applied to the pulse mixer diode D2. Horizontal pulses from the emitter of the horizontal oscillator feed through C18 and C17 to the pulse mixer diode D4. The diodes keep the deflection circuits isolated from one another. Amplifier Q7 inverts and squares mixed blanking pulses that are routed to the vidicon cathode.

2-7. VOLTAGE AND FOCUS REGULATORS

The 12-volt dc input to the camera is tapped down to +9 volts by the series regulator Q20. This is a conventional regulator using Q21 as the preregulator and Q22 as the error amplifier that compares the voltage sample picked off at R97 with the reference voltage developed across the Zener diode D9.

The transistors Q23, Q24 and Q25 comprise a special regulator that maintains a constant current in the focus coil. If focus current should increase, for example, the emitter current of the series Q25 would have to increase as well. This results in an increase in the conduction of Q24 and a subsequent reduction in bias for Q25. In the way changes in the current through Q25, and the focus-coil current, are opposed. Transistor Q23 functions as a differential amplifier with Q24 to maintain a constant emitter voltage at both of these transistors. An increase in emitter current for Q24 results in a drop in emitter current for Q23 so that the voltage drop across R101 is nearly constant.

2-8. HIGH VOLTAGE CONVERTOR

The high voltage convertor is basically a power amplifier-transformer-rectifier system to develop the higher voltages needed for vidicon and viewfinder accelerating potentials, and supply voltage for the viewfinder's video amplifier.

The convertor is driven by 15.625 kHz signals obtained from the collector of Q19 and applied to the pulse amplifier Q301. The pulse amplifier drives both inputs of a bistable multivibrator in the VF module. This multivibrator is not free-running but is made to change state (flip) each time a pulse is received from Q301. Thus the complete output cycle requires two input pulses and the multivibrator output is half 15.625 kHz. A push-pull feed from the collectors of both transistors in the bistable MV drives Q302 and Q303. These transistors, in turn, drive the push-pull output amplifiers Q304 and Q305. Transformer T301 steps up the signal to the values required by the following circuits.

The full secondary of T301 supplies the voltage-multiplier module MF1. This diode circuit multiplies the input by a factor of seven to provide a dc output of 3 kV for the viewfinder's picture tube. The next lower tap feeds a voltage doubler D301 and D302 for the G2, G3 and G4 supplies of the vidicon.

The third tap from the top on T301 drives the half-wave rectifier D303 which supplies +100 volts to the target-voltage regulator system. This same tap also drives D304, which is poled to produce a negative output for the beam (vidicon G1 bias) control.

The lowest tap on the transformer feeds two rectifier circuits. One is formed of D305, a half-wave rectifier that supplies + 30 volts to the blanking circuit Q7. The second rectifier fed from the lowest tap is a voltage doubler D306, 307 that provides + 60 volts to the video amplifier that drives the viewfinder CRT.

2-9. VIEWFINDER

The viewfinder employs a 1" rectangular CRT with a directly-heated cathode and PM focus. Deflection power is derived from the same deflection oscillators that supply the vidicon. Therefore, loss of deflection or high-voltage on the CRT will indicate loss of those voltages on the vidicon as well.

Vertical deflection signals are taken from the vertical circuits at the top of R41 and applied to the deflection amplifier Q12 and Q13 through a waveshaping circuit R52, R53 and C29. R53 serves as the vertical linearity control. The deflection amplifiers are similar to those of the vidicon, and the deflection coils are returned to the emitter of Q12 to provide negative feedback. The amount of feedback is controlled by R57, the height control.

The horizontal output stage Q19 obtains its signal from the secondary of T4; this point drives both horizontal output stages in parallel. The Q19 stage is similar to Q18 except that the CRT circuit does not employ a width or electromagnetic centering control. A secondary on T7 feeds a low heater voltage to the CRT.

Video for the CRT is supplied by Q5. This stage has a +60 volt supply to accommodate the 20 volt (p-p) drive required by the CRT, and employs emitter peaking (C8) and series peaking (L2). R18 adds a variable positive bias to the video signal to permit control of brightness.

During the playback mode of operation video returns on the same line used as the record-output line (pin 1 of the camera cable). To prevent camera video from interfering with the output video of the deck, the playback video signal rides upon a high positive d-c voltage. This voltage is high enough to reverse bias the emitter junction of Q4 to cut off camera output video.

2-10. MICROPHONE

The Electret microphone mounted above the lens mount, requires an external dc supply to power internal FET amplifiers. A voltage divider, fed from the regulated 9 V, and mounted on the separate M board, supplies the necessary voltage.

SECTION 3
MAINTENANCE

3-1. PRECAUTIONS

The following precautions should be observed to prevent damage to the vidicon.

1. Do not subject the vidicon to excessive jarring or mechanical shock.
   Avoid handling the vidicon with the faceplate pointed downward.
2. Before applying power to a defective camera of unknown condition, remove the socket from the vidicon and check deflection signals at the yoke (see Section 3-4 "Deflection Checks"). The vidicon may be damaged if power is applied in the absence of deflection signals.

3-2. DISASSEMBLY

Camera circuits are exposed for service by removing the upper and bottom panels. Remove the four Phillips-head screws that hold the upper cover in place and lift off the upper cover. Then, remove the two screws that secure the bottom cover and remove the bottom cover.

The high-voltage supply board (H) is protected by an insulating panel that is held in place by the board's mounting screws.

The video board (P) is mounted inside a shield case. This board is exposed for service by the following procedure.

1. Unscrew the four Phillips-head screws that secure the shield plate, and remove the shield plate.
2. Pull out the board slightly and unsolder the target lead (white-green-gray) on the board. Then, pull out the board carefully.

3-3. VIDICON REPLACEMENT

To remove the vidicon, proceed as follows:

1. Remove the lens, ornamental ring and the lens mount. The lens mount is secured by three Phillips-head screws.
2. Loosen the two nuts (at the rear of the coil assembly bars) which tighten the vidicon socket to the vidicon coil assembly. See Fig. 3-8.
3. Pull the socket off the base of the vidicon carefully.
4. Push the vidicon out through the front of the camera. Be carefully not to damage the spring connector that contacts with the target ring.
5. Clean the faceplate of the replacement vidicon carefully with lens tissue or a clean lint-free cloth.
6. Insert the replacement vidicon into the front of the camera. Rotate the vidicon until the base index (the lack of a pin between pins 1 and 7) is at the 3 o'clock position. Slide the vidicon back as far as it will go.
7. Push the socket onto the pins carefully. (See Section 3-4)
8. Replace the lens mounting ring. Make sure that the target ring of the vidicon fits the edge of the inner black Bakelite ring.
   Make sure that the rectangular slot on the rear surface of the lens mounting ring is uppermost (at the 12 o'clock position).
9. Replace the ornamental ring and the lens.
10. Proceed to Section 3-5.

3-4. PRELIMINARY CHECKS

Before pushing the socket onto the vidicon, proceed as follows:

Power Voltage Adjustment

The regulated supply in the camera is set for a +9 volt output.

1. Connect the positive probe of an accurate voltmeter to the B+ out terminal on the D board. See Fig. 3-1. Connect the negative probe to the chassis.
2. Adjust R97, on the D board, to produce a reading of +9 volts, ±0.3 volts.

Deflection Checks

1. Connect the scope to the V out terminal on

the D board and check the vertical deflection waveforms shown in Fig. 3-1.

2. Connect the scope to the H out terminal on the D board and check the Horizontal deflection waveforms shown in Fig. 3-1.

3. Do not operate the camera with the vidicon socket connected unless correct deflection signals are observed.

3-5. PRELIMINARY SET-UP

Test Jig (Standard Alignment Set-up)

A test jig for use with the AVC-3420CE camera should be made up as follows.

1. Camera mounting:
   Use a tripod or proper pedestal.

2. Test pattern mounted on board:
   Suggest SONY test pattern (SONY part code No 3-701-397-00).

3. Proper illumination for test pattern:
   The test pattern should be lighted so that all parts of the pattern have the same amount of light. Two 100 watt lamps placed in reflectors and positioned approximate two feet from the pattern will provide adequate lighting.

Monitor Connections

Monitor connections with a Videocorder are necessary when making adjustments on the camera. A convenient way to connect the camera to the monitor is shown in Fig. 3-2 or Fig. 3-3.

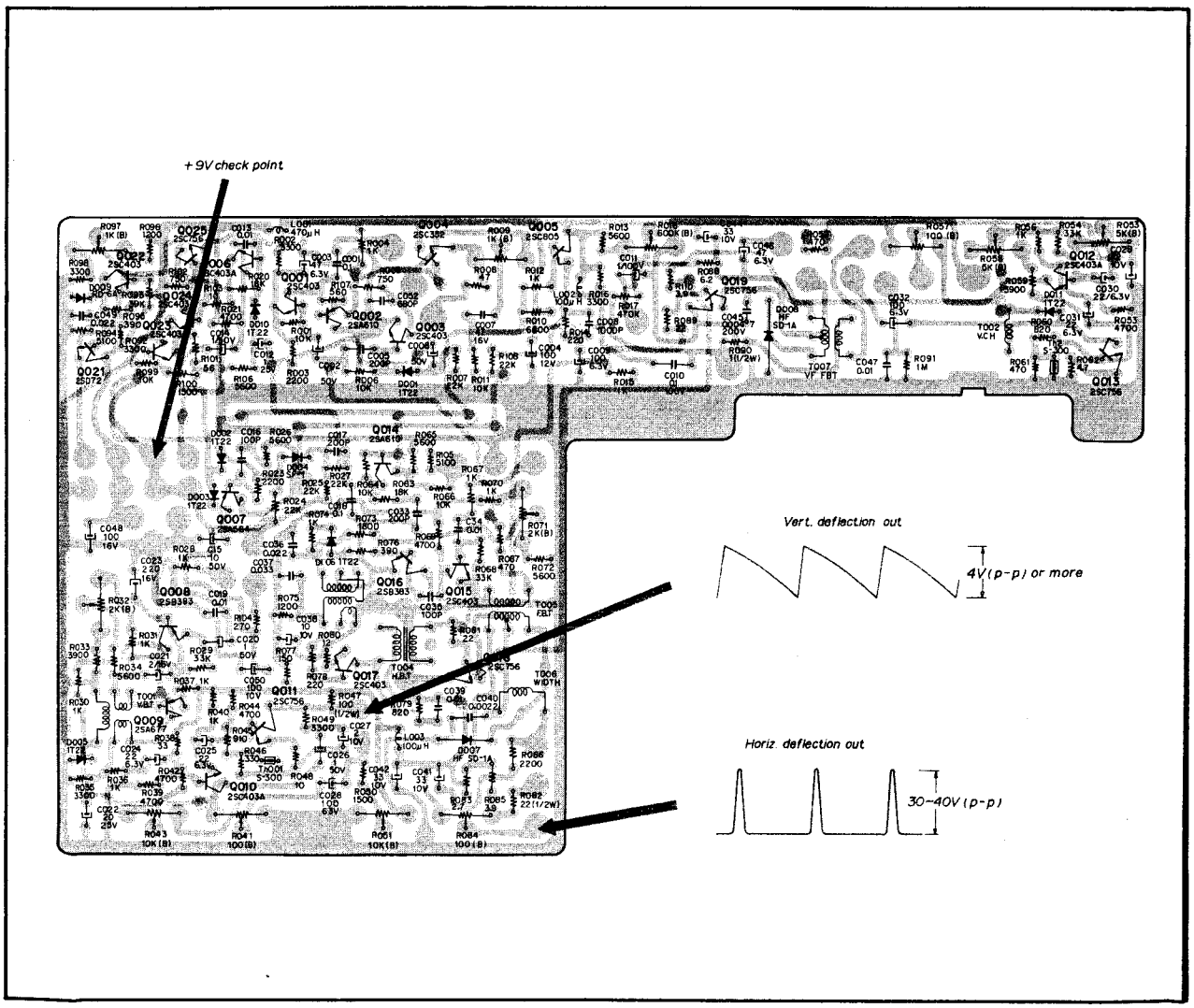


Fig. 3-1. Deflection and B+ check

Because there is interaction between following adjustments, follow the sequence given below.

3-6. VERTICAL FREQUENCY ADJUSTMENT

Procedure A (Factory Service Center)

Equipment required: Frequency counter Philips PM6620 or equivalent.

1. Supply +12 volts to the camera with the regulated power supply. Do not feed the external sync signals to the camera.
2. Connect the input lead of the counter to the V out terminal on the D board. See Fig. 3-4. Connect the ground lead to the chassis.

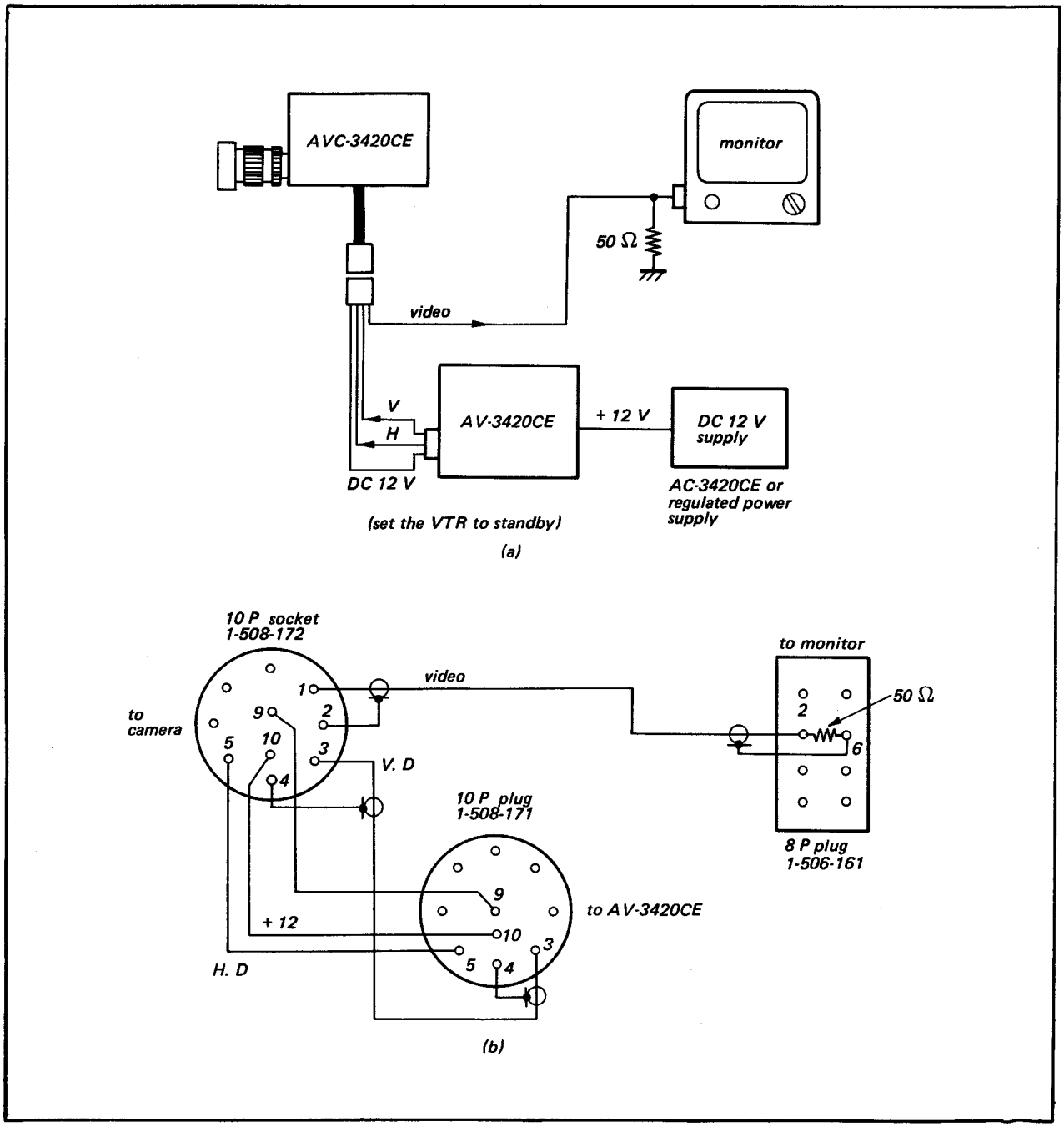


Fig. 3-2. Direct monitor connections

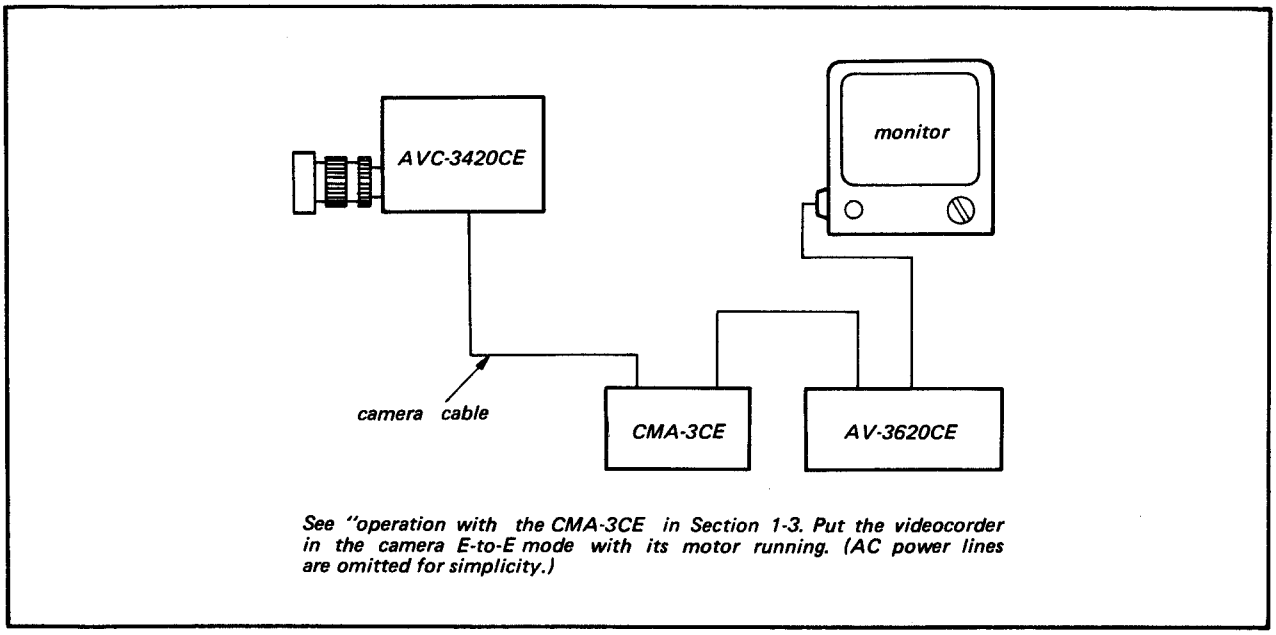

AVC-3420CE
monitor
camera cable
CMA-3CE
AV-3620CE
See "operation with the CMA-3CE in Section 1-3. Put the videocorder in the camera E-to-E mode with its motor running. (AC power lines are omitted for simplicity.)

Fig. 3-3. Setup with CMA-3CE

3. Turn on the counter. Set the Gate Selector to 1 sec.
4. Turn on the camera. Allow a few minutes for warmup.
5. Adjust R32 (V. Frequency) for a stable counter reading of 44 Hz, ±1 Hz.
6. Check operation with the Videocorder as follows. Connect the camera to the Videocorder as shown in Fig. 3-2 or Fig. 3-3. Setup the E--to-E mode and turn the motor on and off several times with tape threaded and recordings in progress. Make sure that the camera locks up properly and has no vertical jitter or bounce, when the motor in the Videocorder is running.
7. Lock R32 with white locking paint.

Procedure B (Field Procedure)

1. Setup the camera as shown in Fig. 3-2 or Fig. 3-3.
2. Turn on all equipment. Run the motor in the Videocorder to feed the vertical sync signals to the camera.
3. Observe the picture on the monitor. Set R32 (V. Frequency) fully counterclockwise and turn it clockwise slowly.
   Stop clockwise rotation where the picture falls out of sync and appears to roll downwards erratically.
   Turn R32 counterclockwise slightly from this position.
4. Lock R32 with white locking paint.

3-7. HORIZONTAL FREQUENCY ADJUSTMENT

Procedure A (Factory Service Center)

Equipment required: Frequency counter Philips PM6620 or equivalent.

1. Supply +12 volts to the camera. Do not feed the external sync signals.
2. Connect the counter to the H out terminal on the D board. See Fig. 3-4.
3. Turn on the counter. Set the Gate Selector to 1 sec.
4. Turn on the camera. Allow a few minutes for warmup.
5. Adjust R71 (H. Frequency) for a stable counter reading of 15 kHz, ±50 Hz.
6. Check operation using the Videocorder. Make sure that the camera locks up properly (monitor picture remains stable), when the Videocorder is on.
7. Lock R71 with white locking paint.

Procedure B (Field Procedure)

1. Setup the camera as shown in Fig. 3-2.
2. Turn on all equipment. Setup the record mode to feed the vertical and horizontal sync signals to the camera.
3. Observe the picture on the monitor and turn R71 (H. Frequency) clockwise until the picture falls out of sync. Then, turn R71 counter-clockwise until the picture again falls out of sync. Set the arm of R71 midway between the settings at which the picture falls out of sync.
4. Lock R71 with white locking paint.

3-8. TARGET VOLTAGE ADJUSTMENT

1. Place the camera in the standard alignment set-up.
2. Connect the scope to the Video out terminal on the D board. See Fig. 3-5.
3. Adjust the scope's controls to display two horizontal sync pulses.
4. Adjust R248 (on the P board), target voltage, to produce an output signal of 0.9 ~ 1.0 volts as shown in Fig. 3-5.

3-9. OPTICAL ADJUSTMENT

1. Turn on the camera and point it at a distant object (farther than 20 m away).
2. Set the lens to infinity, zoom up (f:75 mm) and open the iris fully (F:1.8). Adjust electrical FOCUS on the H board, at the bottom panel, for the sharpest possible focus. See Fig. 3-6.

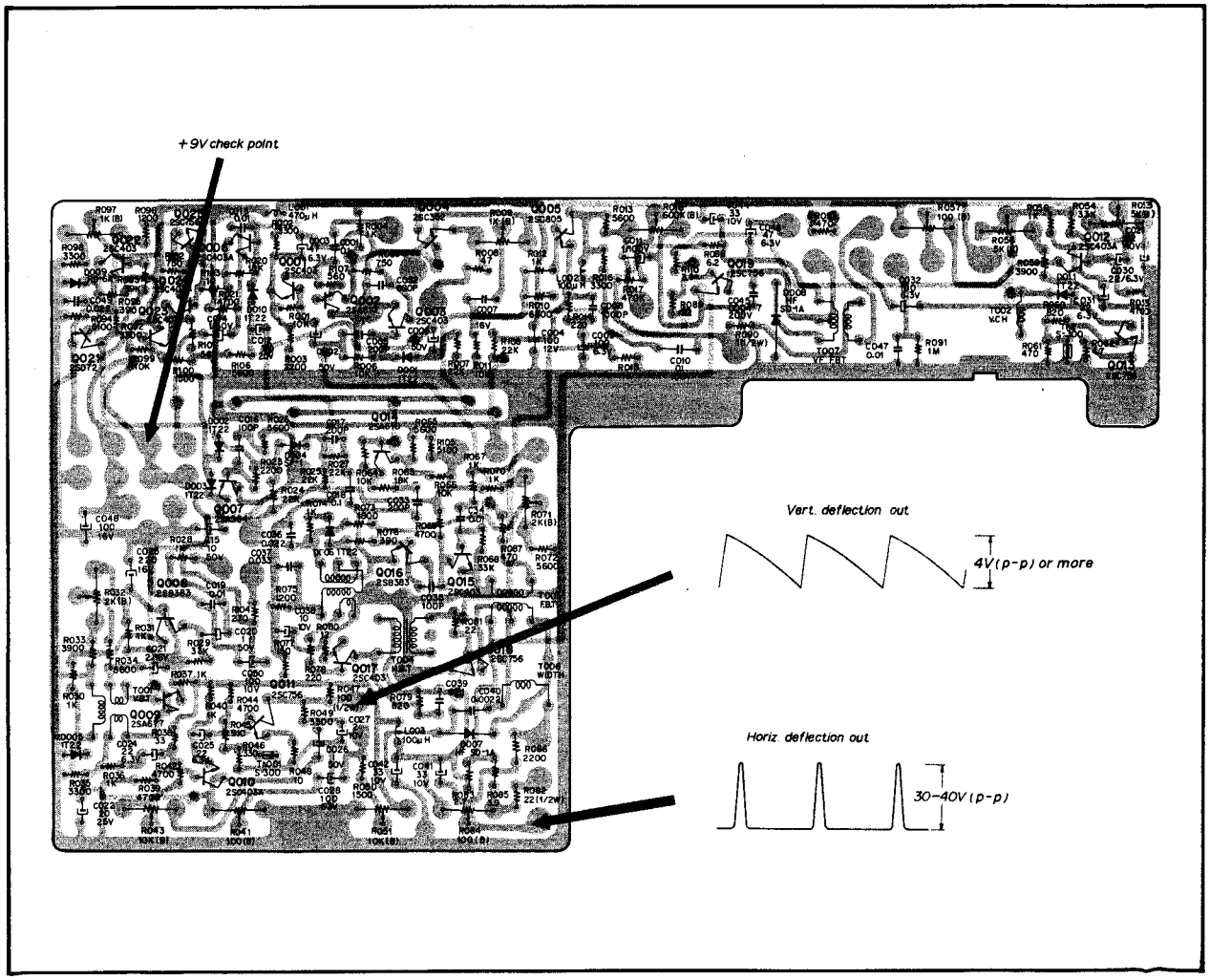


Fig. 3-4. Deflection oscillator adjustments

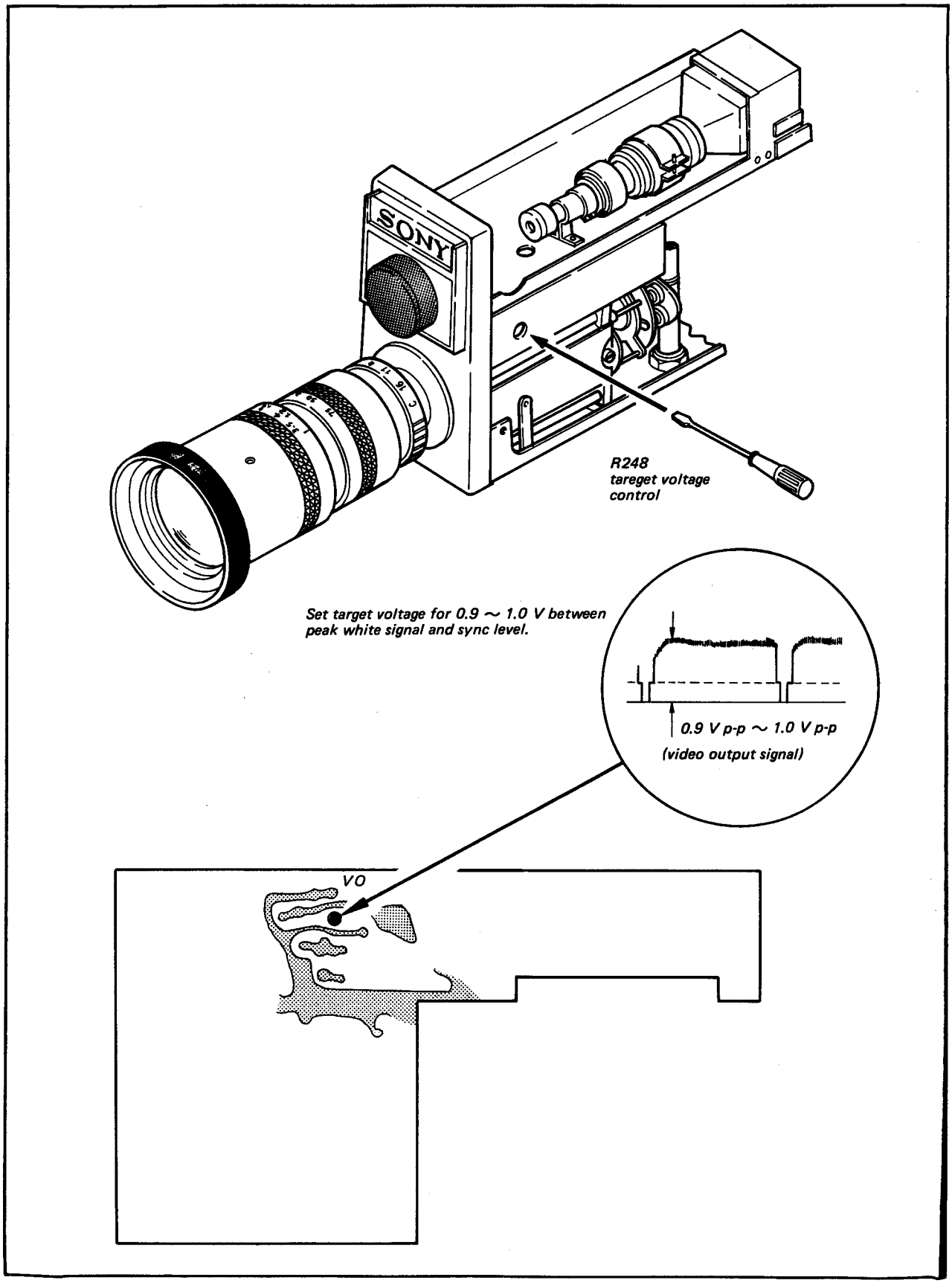


Fig. 3-5. Target voltage adjustment

Note: It is important to have electrical focus set correctly before the following adjustments are attempted.

3. Remove the lens and the ornamental ring. Replace the lens.

4. Observe the picture on the monitor and turn the inner ring of the lens mount clockwise or counterclockwise slightly for the best focus, using the alignment tool as follows:
Insert the flange back alignment tool into the slit atop the lens mount and slide it into the groove on the inner ring of the lens mount. See Fig. 3-6.

3-10. ELECTRICAL FOCUS ADJUSTMENT

1. Point the camera at the test pattern and set optical focus correctly.

2. Adjust electrical FOCUS control R321, at the bottom panel, for the sharpest possible focus.

3-11. TILTED PICTURE CORRECTION

If the picture is tilted (not upright) the deflection coil must be rotated about its axis.

1. Loosen the two screws that secure the white plastic ring to the coil assembly. See Fig. 3-8.

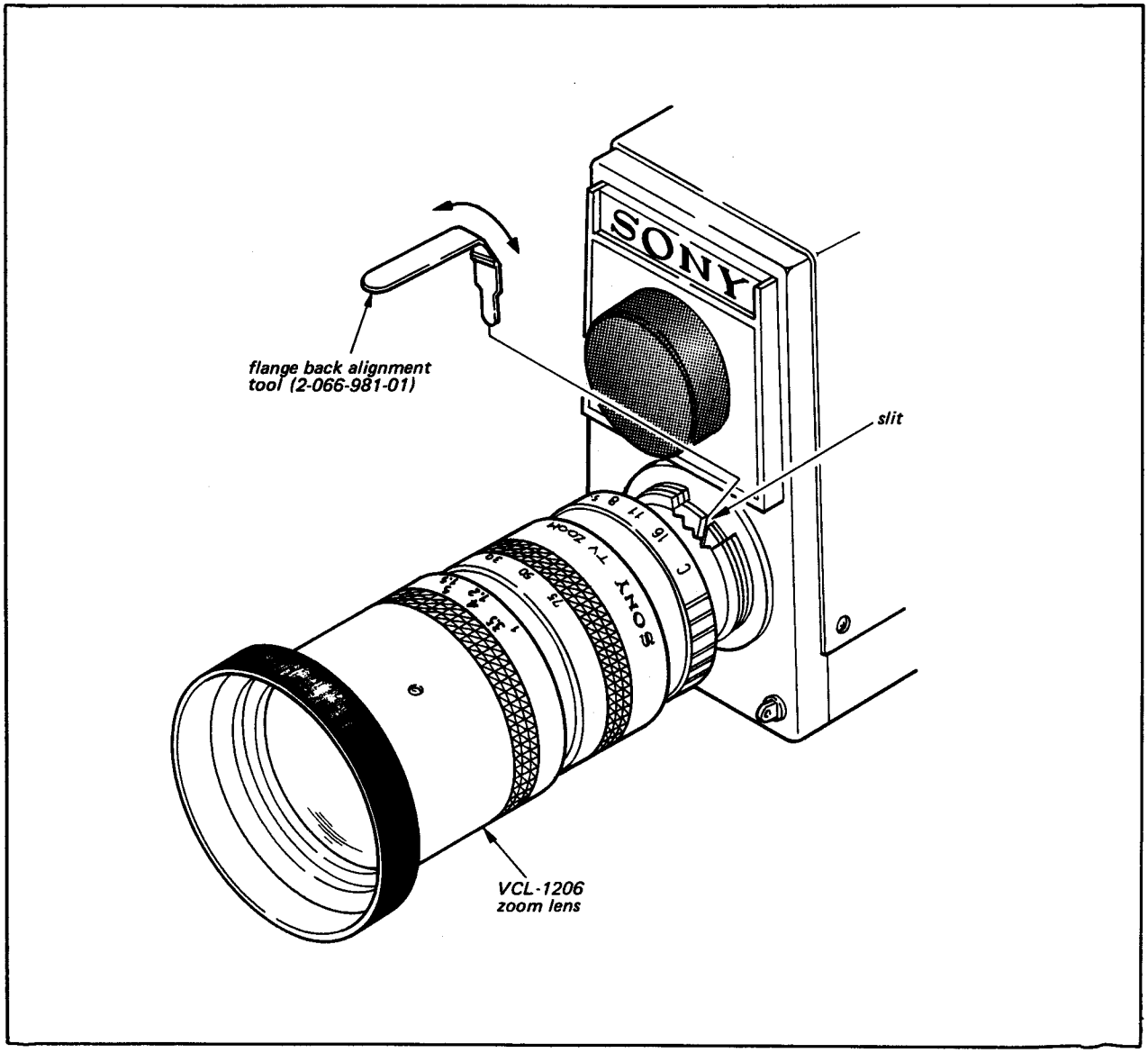
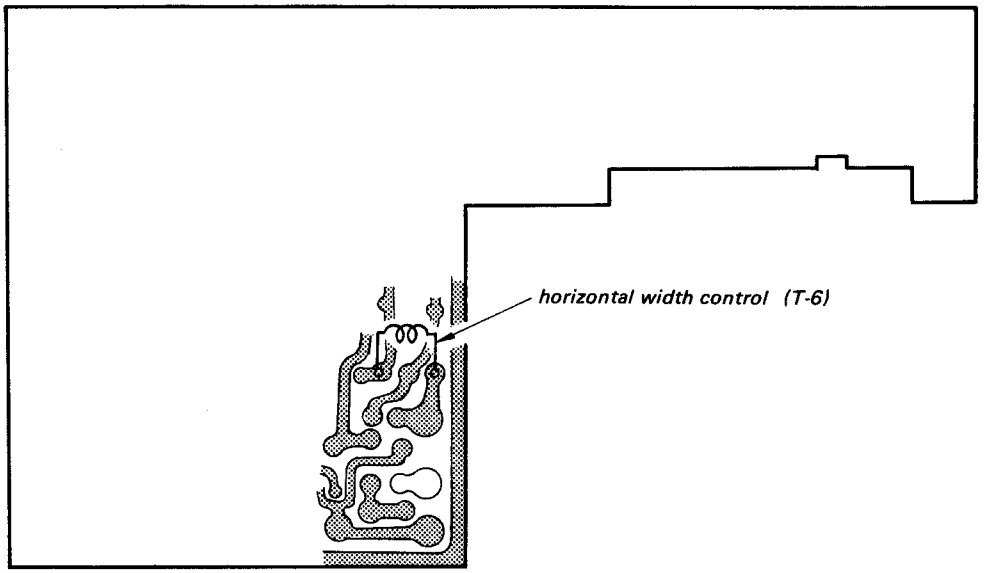


Fig. 3-6. Optical focus adjustment



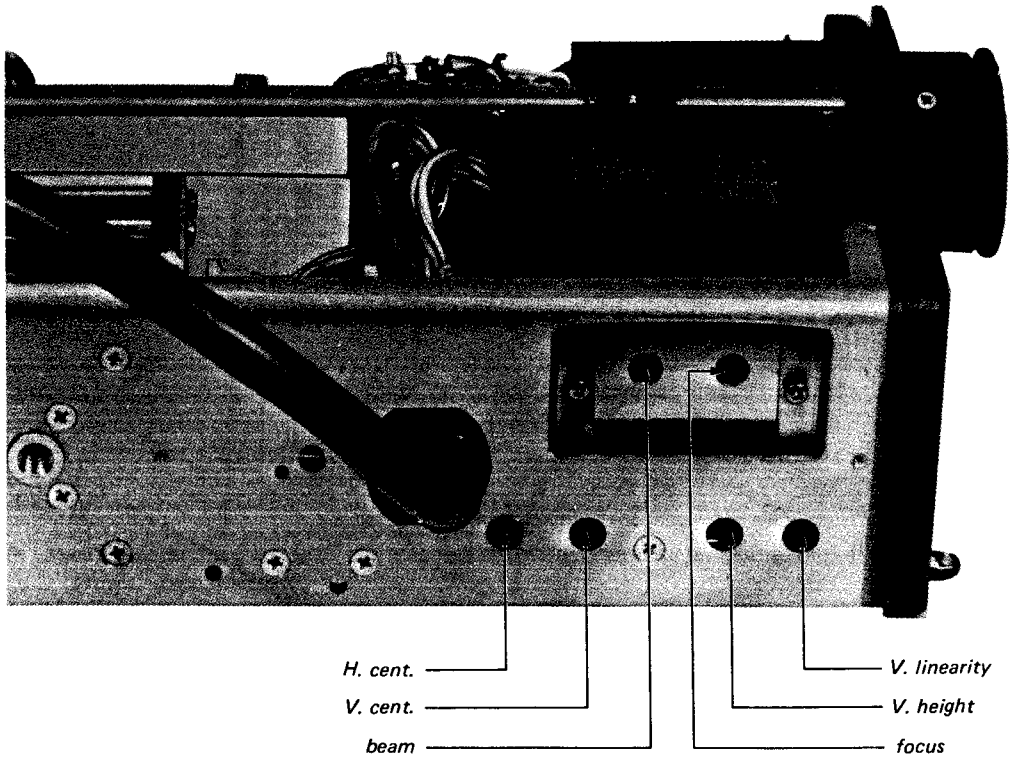


Fig. 3-7. Alignment points

Rotate the coil until the picture is upright, and tighten the two screws.

Occasionally, a "beat pattern" (narrow stripes) may be observed in the picture at or near the correct focus setting. This symptoms can be usually be remedied by rotating the vidicon to a new position inside the coil. Loosen the two screws that tighten the vidicon socket to its holder and turn the vidicon slightly. Tighten the screws at the best vidicon position.

Note: Make sure that flange back is set correctly whenever the coil or the vidicon is rotated. If necessary, readjust flange back.

3-12. CENTERING ADJUSTMENT

1. Turn R51 (V. Center) and R84 (H. Center) alternately to position the test pattern center (in the picture) at the center of the Monitor's screen. See Fig. 3-7 for location of controls.

3-13. SETTING OF SCANS

Check B+, as described in Section 3-4, before making any adjustment to the deflection circuits.

Mount the standard lens (f:16 mm) on the camera whenever you adjust scan amplitude (i. e. picture size adjustment.).
Point the camera at the test pattern. The distance between the lens mounting ring and the test pattern should be 440 mm. See Fig. 3-9.

Note: The distance (L) between the test pattern and the lens mount is given by the following equation.

$$L=\frac{f(H+6.3)}{6.3}+\frac{f(H+6.3)}{H}-17.53\ (mm)$$

where f is the focal distance of the lens and H is height of the test pattern. If

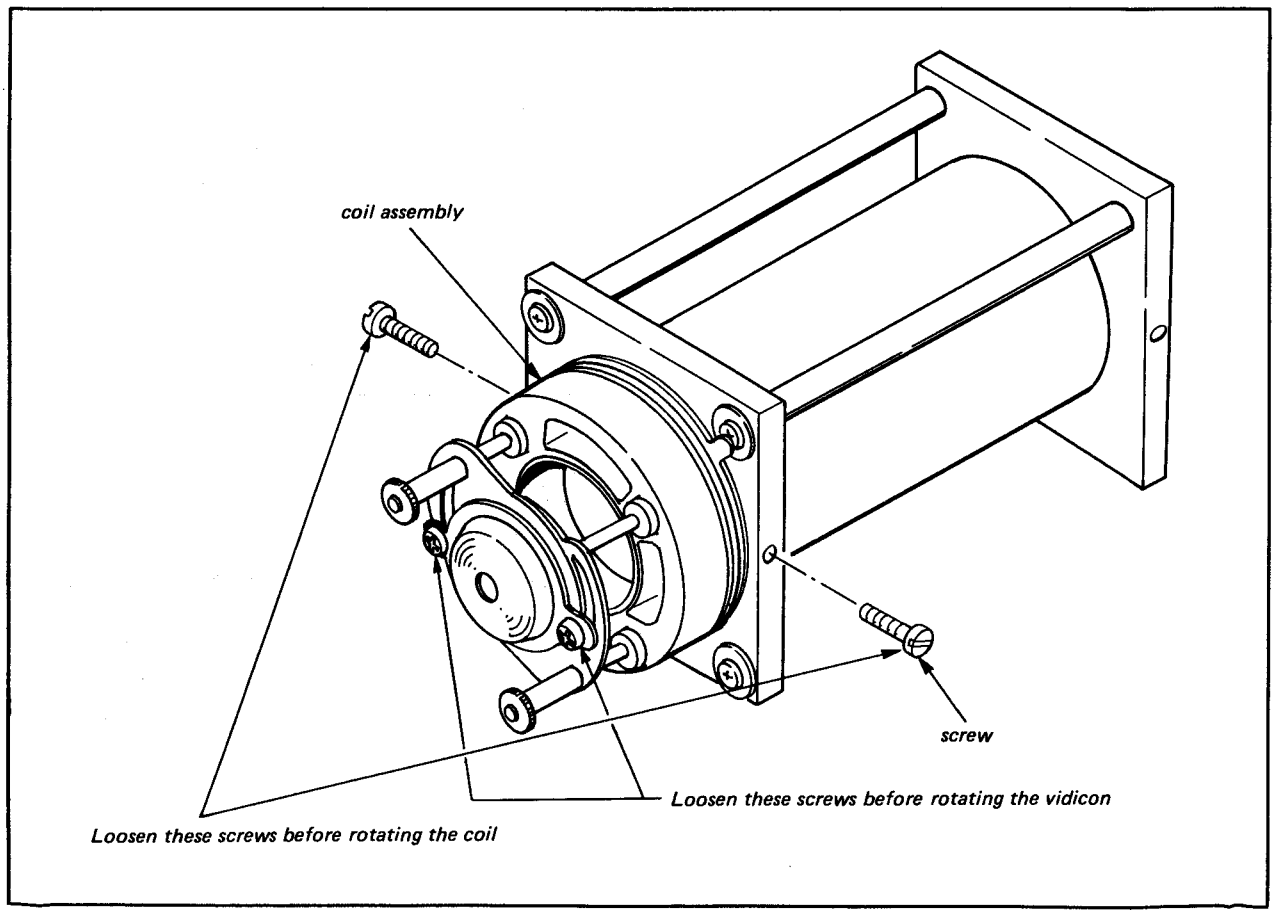


Fig. 3-8. Vidicon coil assembly

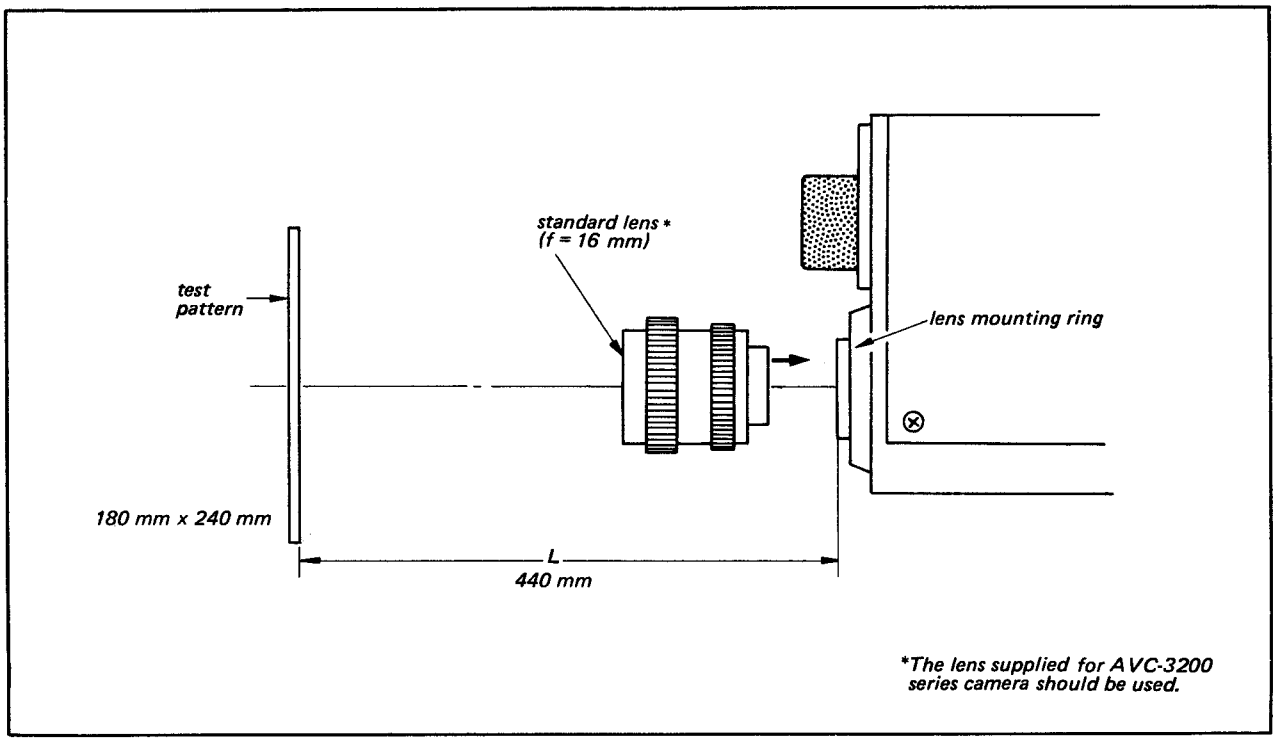


Fig. 3-9. Setup for scan adjustments

Vertical Size Adjustment

1. Make sure that the monitor is not overscanned and has good linearity.
2. Observe the monitor and adjust R41 (V. Height) for correct picture height. See Fig. 3-7 for control locations.
3. Adjust R43 (V. Linearity) for best linearity on the picture. See Fig. 3-7.

Horizontal Size Adjustment

1. Dig out the wax in the core of T-6 (H. Width). See Fig. 3-7.
2. Observe the monitor and turn the core of T-6 carefully for correct picture width.
3. Reseal the core by softening the wax with a soldering iron.

Note: Use a non-metallic screwdriver type alignment tool to adjust T-6.

3-14. ALIGNMENT MAGNETS ADJUSTMENT

The vidicon employs a pair of PM beam-alignment magnets mounted back of the coil assembly. See Fig. 3-10. To check beam alignment, rotate electrical focus control R321, at the bottom panel, and watch the monitor. The picture should appear to rotate about the center of the screen. If the picture center shifts to the side or up or down, as focus is turned, the alignment magnets should be adjusted. Proceed as follows:

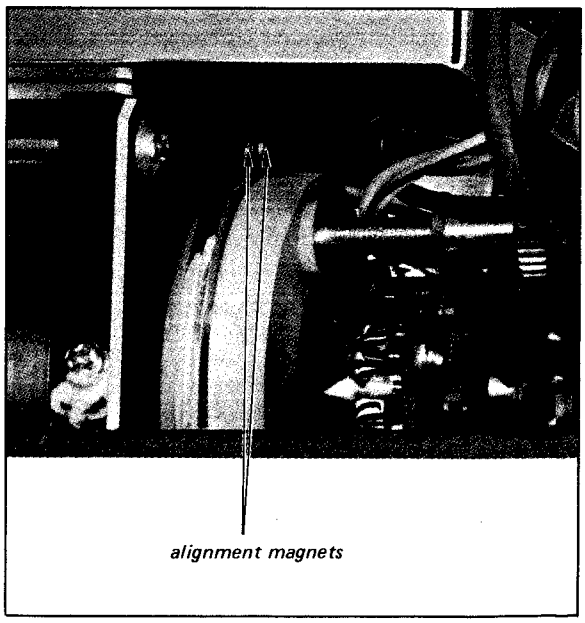


Fig. 3-10. Alignment magnets adjustments

1. Mate the perforated tab with the unperforated tab, and rotate entire assembly until the point around which it appears to rotate remains in the screen center, as focus is turned.
2. After the above procedure, if the picture center shifts to the side or up or down, as focus is turned, spread the tabs slightly and rotate entire assembly again. Repeat this procedure (changing the spread of the tabs) until the best beam alignment is obtained. (The picture center remains in the screen center as focus is turned.)
3. Lock the alignment magnets with white locking paint.

Note: Picture centering and size should be readjusted whenever the alignment magnets have been adjusted: Repeat procedure Section 3-12 and 3-13. Then, make sure that electrical focus is set correctly. If necessary, repeat focus setting procedure.

3-15. BEAM SETTING

1. Turn R325 (Beam) at the bottom panel. See Fig. 3-7. Turn this control fully clockwise then turn counterclockwise slowly until the picture shows good contrast with no loss of detail in the highlights.
2. Point the camera at ceiling-mounted fluorescent lamps (at least 3 m away). Then, pan the camera to the right and left to check for excessive image lag (persistence) following highlights. Turn R325 counterclockwise to the point at which image lag appears and then reset slightly until no lag is visible.
3. Lock R325 with white locking paint.

3-16. VIDEO AND SYNC OUTPUT CHECKS

No adjustment is required for the video and sync signal output. The ASC system maintains a constant video output (approx. 0.7 volts) over a wide range of light values.

The sync signal output has been fixed at approximate 0.3 volts by Q1 on the D board.

Make sure that signal outputs are as follows:

1. Connect the camera to the AV-3400 in the usual way.
2. Connect the scope to the Video out terminal on the D board. See Fig. 3-5.
3. Make sure that the video and sync signal output level are set correctly.

Note: If sync signal output level is incorrect check circuit operation. Then proceed as follows:

1. If sync signal output is below 0.3 volts, add a resistor (in the range of 10 to 20 kilohms) in parallel with R2 (the emitter bias resistor of Q1) on the D board.
2. If sync signal output is above 0.3 volts, add a resistor (in the range of 10 to 20 kilohms) in parallel with R3 (the emitter bias resistor of Q1) on the D board.

3-17. VIDEOCORDER RETURN VIDEO CHECK

Check the dc voltage at the emitter of Q4 with

The dc voltage should be between 3 to 4 V dc. If not select values for R2 (bias resistor of Q1).

3-18. VIEWFINDER ADJUSTMENT

Vertical and Horizontal Deflection Checks

Before pushing the socket onto the picture tube, check the following.

1. Connect the scope to the collector of Q19 on the D board and check to see that correct output waveforms (approx. 120 Vp-p) can be observed. See waveforms 8 in Section 4-5.
2. Connect the scope to the collector of Q13 on the D board and check output waveforms. See waveforms 18 in Section 4-5.
3. Turn off the camera and push the socket onto the CRT.

Before making any adjustments on the viewfinder, adjust the eyepiece on the viewfinder to suit

your optical requirements.

Focus Adjustment

1. Turn on the camera and make sure the raster can be seen on the CRT.
2. Point the camera at the test pattern. Adjust R9 (Contrast) and R18 (Brightness), on the D board, for correct picture quality. viewfinder.
3. Rotate the PM focus magnet and move it back or forth slightly for the sharpest picture. See Fig. 2-1.
4. Lock the PM magnet by softening the wax with a soldering iron.

Centering Adjustment

1. Adjust the centering magnets. See Fig. 2-1. Spread the tabs and rotate the magnets so that the picture center is positioned at the center of the viewfinder's screen.

Vertical Size Adjustment

Set R57 (V. Height), R53 (V. Linearity) and R58 (V. Bias) for correct picture height and linearity. Adjust for 6% overscan.

> **Note:** Horizontal width has been fixed at the factory. Horizontal width can not be adjusted in the field.

Cue Lamp Check

The cue lamp in the viewfinder should light whenever the button on the front of the camera or grip trigger is pulled.

3-19. MICROPHONE REPLACEMENT

PRECAUTIONS

To prevent damage to the built-in Electret microphone;

1. Do not bend the microphone leads excessively.
2. Keep the microphone away from solvents, adhesives or some plastics such as soft vinyl, vinyl acetate or other plastics containing plasticizers.
3. Do not place the microphone in ambient temperatures of over 60°C.
4. Never disassemble the microphone.

To replace the microphone, proceed as follows;

1. Remove the upper cover. Then, remove the M (microphone) board and the D board.
2. Unsolder the microphone cable at the M board.
3. Remove the two Phillips-head screws securing the microphone to the chassis. See Fig. 3-11.
4. Install the replacement Electret microphone to the chassis, and then solder the microphone cable to the M board.
5. Install the M board and the D board in place on the chassis.

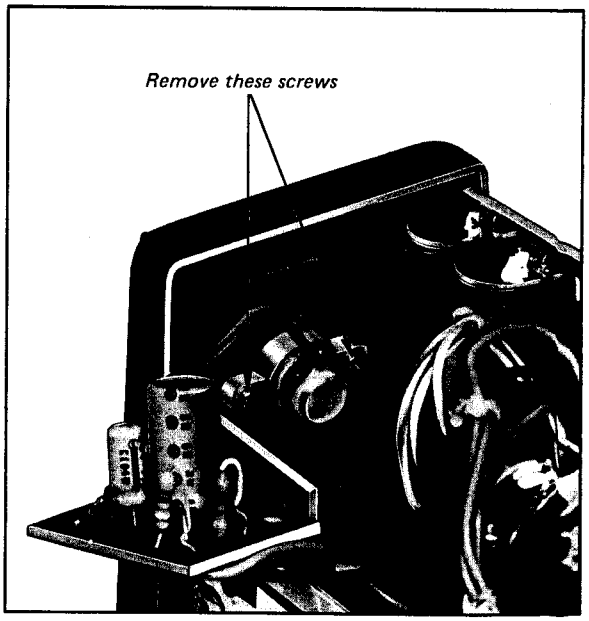
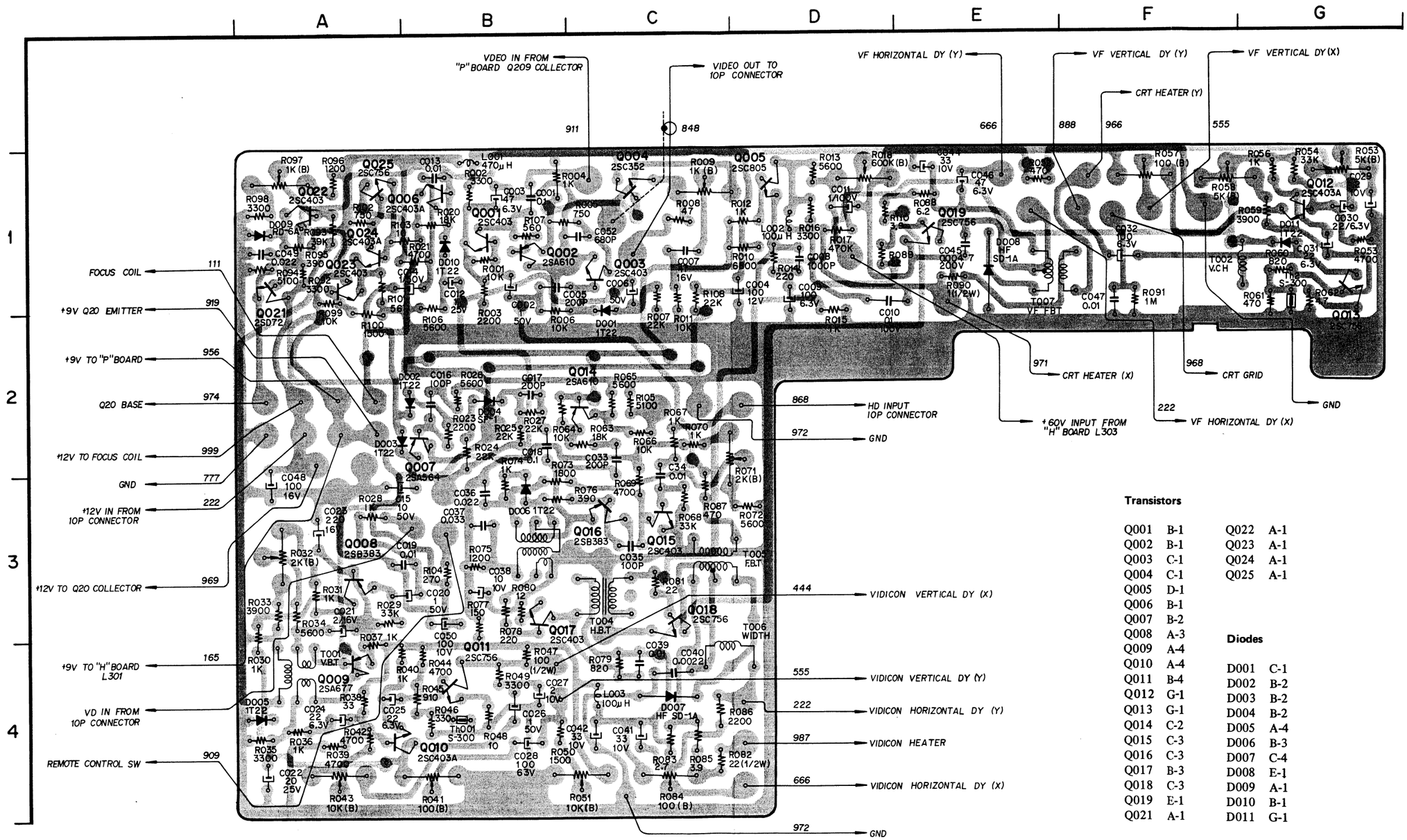


Fig. 3-11. Microphone replacement

SECTION 4 PRINTED CIRCUIT BOARDS, SCHEMATIC DIAGRAM

4-1. "D" DEFLECTION PRINTED CIRCUIT BOARD —— CONDUCTOR SIDE



Transistors

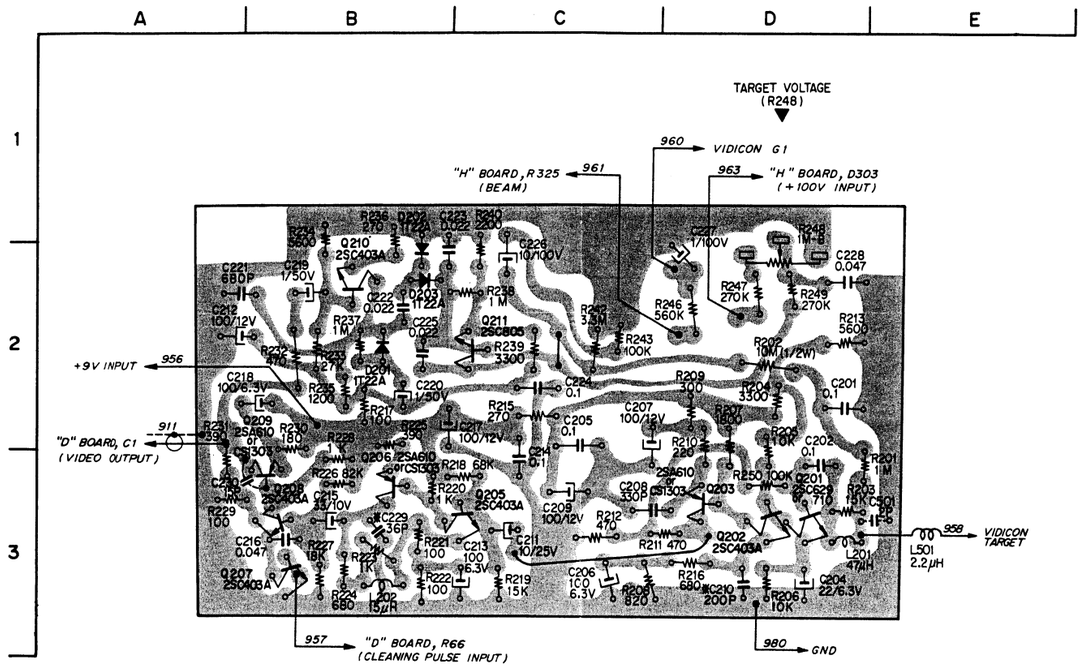
Q001	B-1	Q022	A-1
Q002	B-1	Q023	A-1
Q003	C-1	Q024	A-1
Q004	C-1	Q025	A-1
Q005	D-1		
Q006	B-1		
Q007	B-2		
Q008	A-3		
Q009	A-4		
Q010	A-4		
Q011	B-4		
Q012	G-1		
Q013	G-1		
Q014	C-2		
Q015	C-3		
Q016	C-3		
Q017	B-3		
Q018	C-3		
Q019	E-1		
Q021	A-1		

Diodes

D001	C-1
D002	B-2
D003	B-2
D004	B-2
D005	A-4
D006	B-3
D007	C-4
D008	E-1
D009	A-1
D010	B-1
D011	G-1

X-20423-56-6

4 - 2. "P" VIDEO PRINTED CIRCUIT BOARD —— CONDUCTOR SIDE

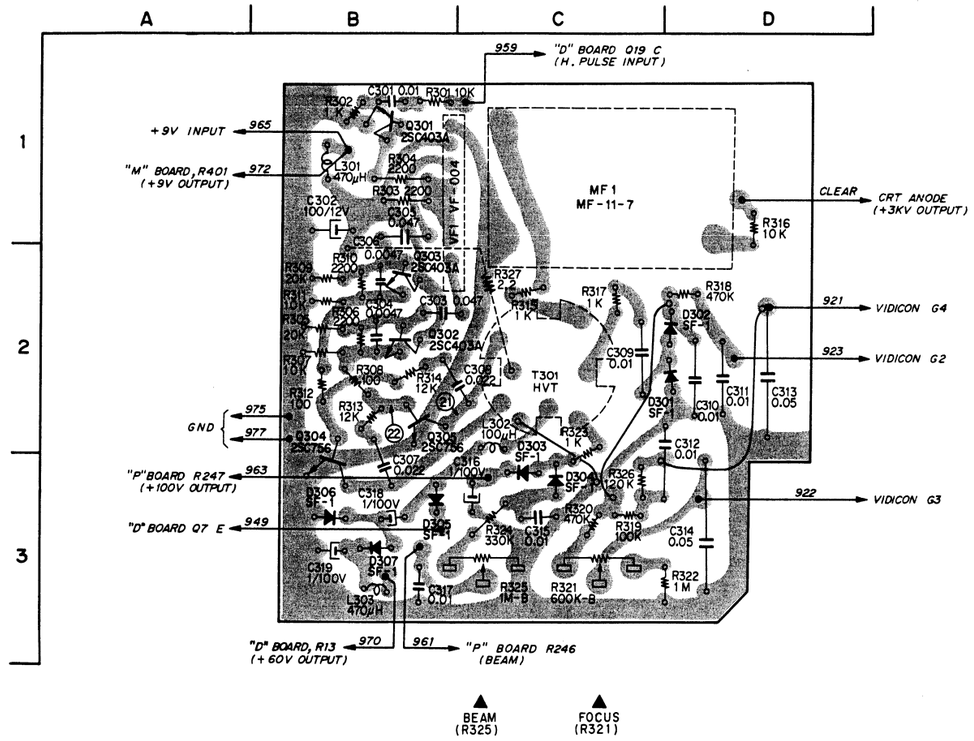


Location

D201 B-2	Q201 D-3	Q207 B-3
D202 B-2	Q202 D-3	Q208 B-3
D203 B-2	Q203 D-3	Q209 B-3
	Q205 C-3	Q210 B-2
	Q206 B-3	Q211 C-2

X-20423-52-8

4 - 3. "H" HIGH VOLTAGE PRINTED CIRCUIT BOARD —— CONDUCTOR SIDE

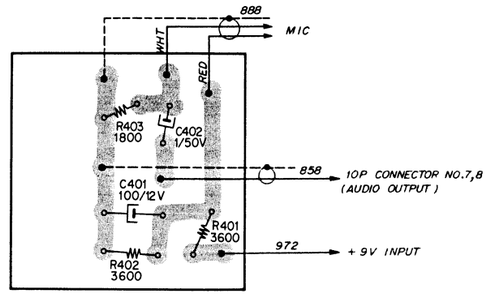


X-20423-51-4

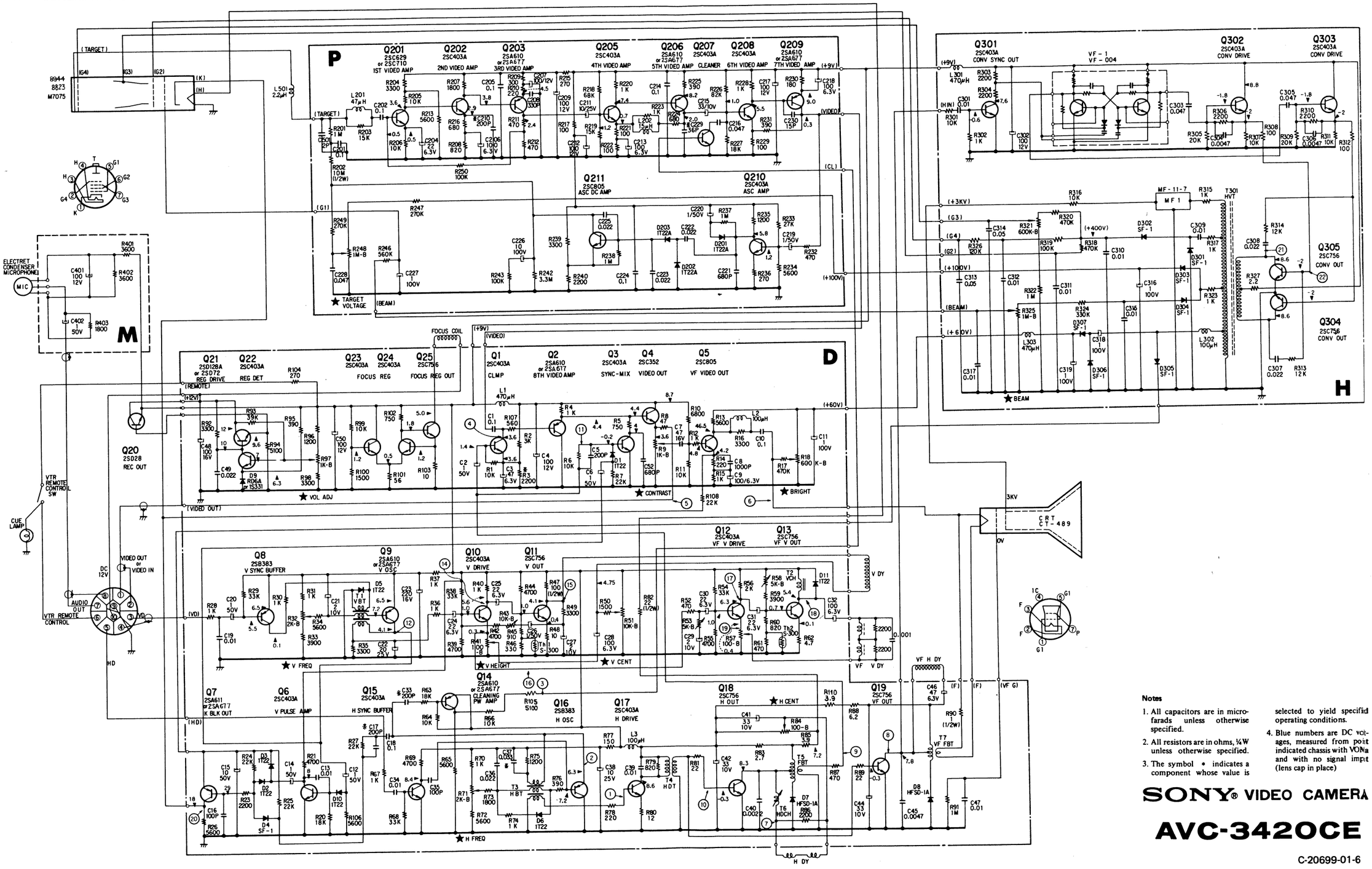
Location

D301 D-2	D306 B-3	Q301 B-1
D302 D-2	D307 B-3	Q302 B-2
D303 C-3		Q303 B-2
D304 C-3		Q304 B-3
D305 B-3		Q305 B-2

4 - 4. "M" MICROPHONE PRINTED CIRCUIT BOARD —— CONDUCTOR SIDE



4 - 5. SCHEMATIC DIAGRAM



Notes

1. All capacitors are in microfarads unless otherwise specified.
2. All resistors are in ohms, ¼W unless otherwise specified.
3. The symbol • indicates a component whose value is selected to yield specified operating conditions.
4. Blue numbers are DC voltages, measured from point indicated chassis with VONa and with no signal impt (lens cap in place)

SONY® VIDEO CAMERA

AVC-3420CE

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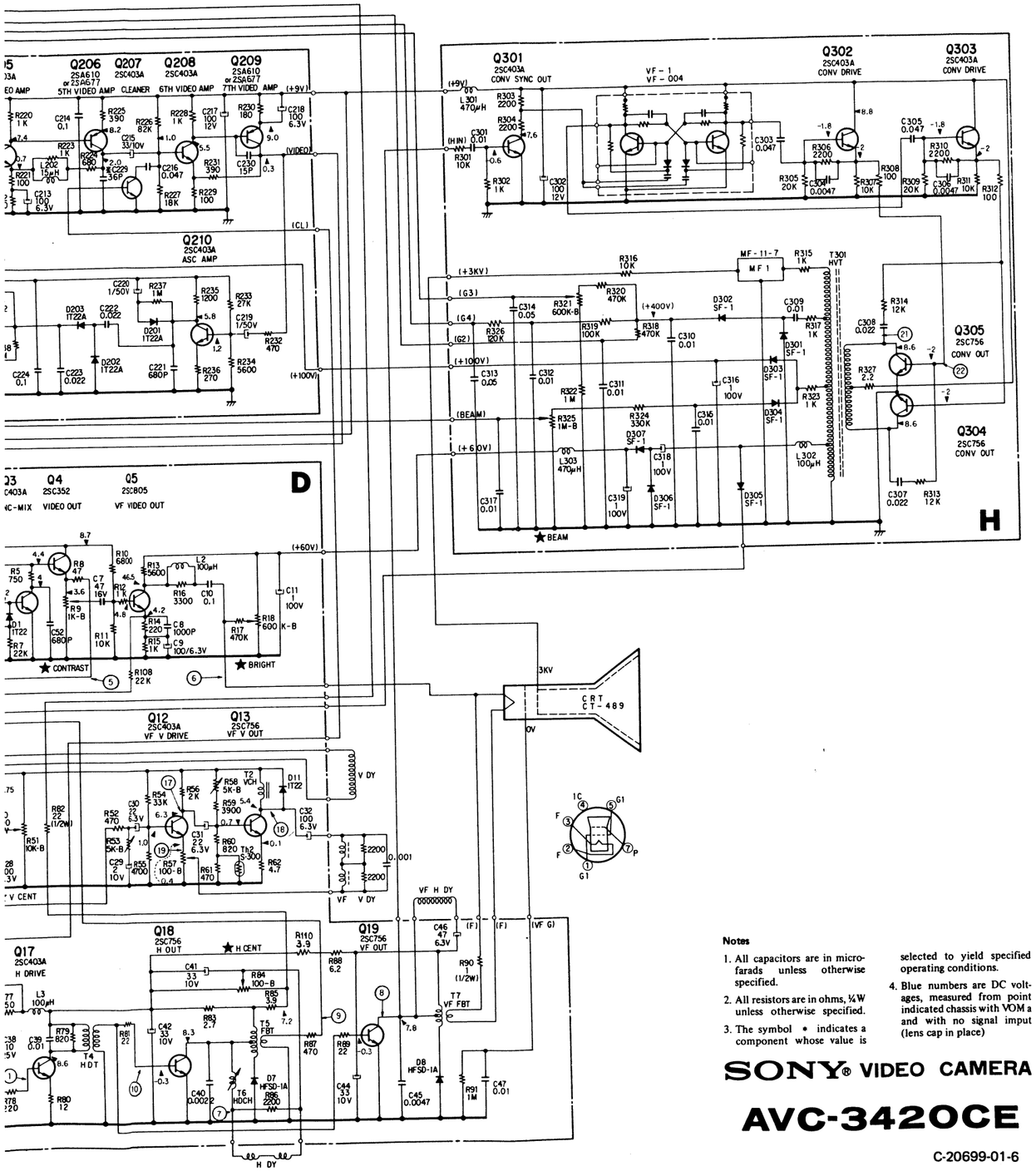

Notes

1. All capacitors are in microfarads unless otherwise specified.
2. All resistors are in ohms, ¼W unless otherwise specified.
3. The symbol • indicates a component whose value is selected to yield specified operating conditions.
4. Blue numbers are DC voltages, measured from point indicated chassis with VOM a and with no signal imput (lens cap in place)

SONY® VIDEO CAMERA

AVC-3420CE

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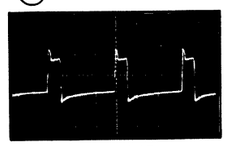
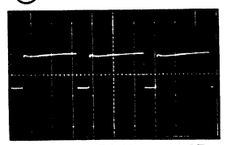
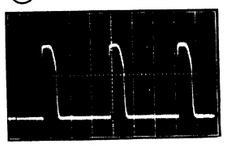
WAVEFORMS



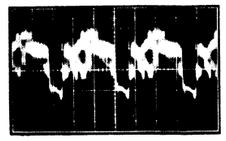
① H. drive pulse, Q17B
1 V/cm, 20μs/cm



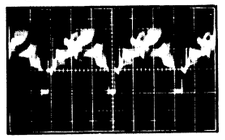
② cleaning in, BLK in, Q16E
5 V/cm, 20μs/cm



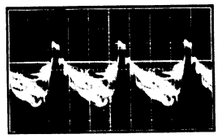
③ cleaning pulse
0.2 V/cm, 20μs/cm



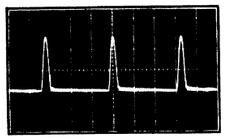
④ video in
0.2 V/cm, 20μs/cm



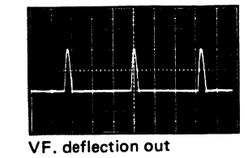
⑤ video out
0.2 V/cm, 20μs/cm



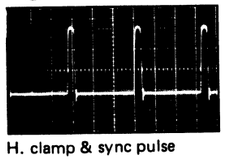
⑥ VF. video out
5 V/cm, 20μs/cm



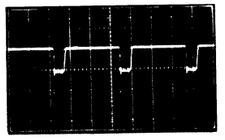
⑦ H. deflection out
10 V/cm, 20μs/cm



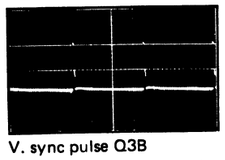
⑧ VF. deflection out
50 V/cm, 20μs/cm



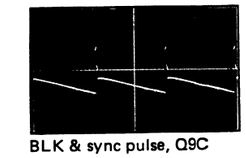
⑨ H. clamp & sync pulse
1 V/cm, 20μs/cm



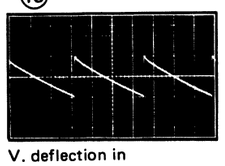
⑩ Q18B
5 V/cm, 20μs/cm



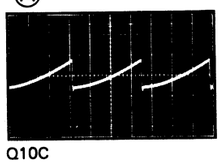
⑪ V. sync pulse Q3B
0.5 V/cm, 5 ms/cm



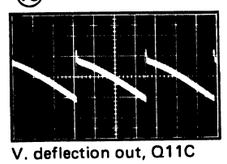
⑫ BLK & sync pulse, Q9C
1 V/cm, 5 ms/cm



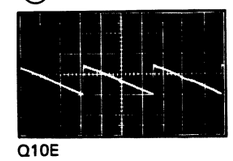
⑬ V. deflection in
0.5 V/cm, 5 ms/cm



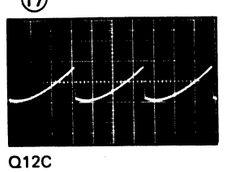
⑭ Q10C
0.5 V/cm, 5 ms/cm



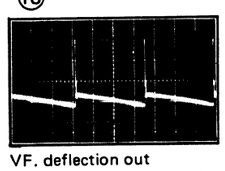
⑮ V. deflection out, Q11C
2 V/cm, 5 ms/cm



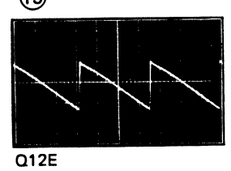
⑯ Q10E
0.5 V/cm, 5 ms/cm



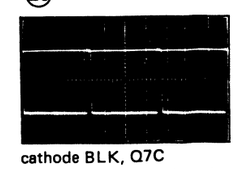
⑰ Q12C
0.2 V/cm, 5 ms/cm



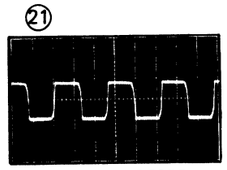
⑱ VF. deflection out
10 V/cm, 5 ms/cm



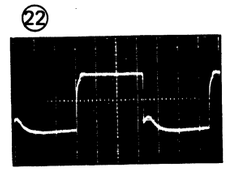
⑲ Q12E
0.2 V/cm, 5 ms/cm



⑳ cathode BLK, Q7C
10 V/cm, 5 ms/cm



㉑ dc-dc convertor Q305C
10 V/cm, 20μs/cm



㉒ Q305B
2 V/cm, 20μs/cm

Note: The waveforms ① to ㉒ correspond to the numbers in the schematic diagram and the printed circuit board layouts.

SECTION 5
MECHANICAL PARTS AND ELECTRICAL PARTS LIST

5-1. MECHANICAL PARTS

Part No.	*Description*
X-20423-02-0	Shoulder Strap Ass'y, including
2-042-389-00	Shoulder Strap
3-808-525-00	Triangle Ring
3-808-526-00	Band Stopper (1)
3-813-711-00	Lock Ring
3-813-715-00	Band Stopper (2)
X-20669-02-0	Bottom Cushion Ass'y
X-20669-03-0	Upper Cushion Ass'y
X-20669-04-0	Grip Ass'y, including
2-042-368-00	Spring, rewind
2-066-925-02	Grip A
2-066-926-02	Grip B
2-066-928-00	Bracket A, grip
2-066-929-03	Bracket B, grip
2-066-932-02	Lever, start
2-066-935-00	Pin A
2-066-938-02	Screw, grip
2-066-939-00	Support
2-066-958-00	Trigger
2-066-960-00	Cap, grip
2-066-961-00	Nut A
2-066-962-00	Screw, ornamental, grip
2-066-964-00	Base Pin
2-066-965-00	Cover, support
2-066-967-00	Bracket, support
2-066-968-00	Nut B
2-066-969-02	Holder, support
2-066-980-00	Spring
7-621-255-42	Screw, (+) P 2 x 6
7-621-255-52	Screw, (+) P 2 x 8
7-621-259-32	Screw, (+) P 2.6 x 5
7-621-559-49	Screw, (+) K 2.6 x 6
7-621-559-72	Screw, (+) K 2.6 x 12
7-621-721-88	Screw, (+) K 2.6 x 8
7-623-907-03	Washer, 2.6 x 5.5, plastic
7-623-910-03	Washer, 4 x 10, plastic
X-20669-07-0	Lens Mount Ass'y, including
2-044-813-00	Front Ring (A)
2-044-814-00	Front Ring (B)
2-044-815-00	Lens Mount (A)
2-044-816-00	Lens Mount (B)
2-044-817-00	Wave Washer
X-20669-08-0	Emblem Ass'y, including
2-066-954-00	Emblem VIDEO CAMERA
2-066-985-00	Adhesive Tape
2-069-604-00	Emblem SONY
X-20829-04-0	Lens Cap Ass'y
Y-20925-21-0	Zoom Lens Ass'y, including
2-036-969	Caution Label, high voltage
2-040-910	Plastic Bag
2-042-329	Protector, band
2-042-330	Band, CRT
2-042-333	Bracket, CRT
2-042-334-02	Shield Case, H board
2-042-335-04	Shield Cover
2-042-336	Mount, tripod
2-042-337	Patch
2-042-339	Strap Hanger
2-042-343-02	Lever, operation start
2-042-349	Base Plate B, shield case
2-042-356	Holder
2-042-360	Ornamental Ring, lens mount
2-042-368	Spring, reset
2-042-375-04	Bobbin, CRT
2-042-376-03	Centering Magnet, CRT
2-042-383-05	Shield Case, P board
2-044-808	Guide, cue
2-044-809	Insulator, H board
2-044-810	Bracket, DF board
2-044-815	Lens Mount A
2-044-816-02	Lens Mount B
2-044-817	Corrugated Washer, lens mount
2-044-833	Bushing, rubber
2-044-834	Sash
2-046-201	Sheet, tripod adaptor
2-046-202	Plastic Bag
2-046-203	Washer, plastic
2-066-901	Screen
2-066-902	Escutcheon, microphone
2-066-903	Wind Screen A
2-066-904	Wind Screen B
2-066-905-02	Angle, CRT
2-066-907-02	Holder, eyepiece
2-066-908-03	Holder, eyepiece
2-066-909	Retainer Ring
2-066-910	Ring
2-066-911-04	Hood, CRT
2-066-915	Holding Bracket, microphone
2-066-916-04	Cover
2-066-917-02	Chassis
2-066-918	Cover, bottom
2-066-919	Bracket, switch
2-066-920-02	Start Button
2-066-921	Plate, operation start lever
2-066-922	Bracket, deflection yoke
2-066-942	Bushing
2-066-955	Eyepiece
2-066-956	Eyecup
2-066-957-02	Holder, eyepiece
2-066-959	Spring
2-066-970-02	Support B, cover
2-066-971	Pin, spring
2-066-972-02	Support A, cover
2-066-986	Packing Carton
2-066-988	Nameplate
2-066-989	CAUTION Plate
2-825-005	Spacer, mica
2-832-002	Bush, insulator

Part No.	*Description*
3-790-577-11	Instruction Manual
4-003-901-01	Corrugated Washer
7-491-001-01	Desiccant
8-720-28	Insulator, mylar
4-008-364	CAUTION Label

SCREWS

7-621-255-22	(+) P 2 x 4
7-621-259-22	(+) P 2.6 x 4
7-621-259-42	(+) P 2.6 x 6
7-621-259-52	(+) P 2.6 x 8
7-621-261-52	(+) P 3 x 8
7-621-555-22	(+) K 2 x 4
7-621-559-22	(+) K 2.6 x 4
7-621-559-38	(+) K 2.6 x 5
7-621-559-49	(+) K 2.6 x 6
7-621-561-82	(+) K 3 x 14
7-621-655-38	(+) RK 2 x 5
7-621-659-46	(+) RK 2.6 x 6
7-621-721-73	(+) K 2.6 x 6, tapping

NUT

7-622-108-02	3 mm dia

Part No.	*Description*

WASHERS

7-622-408-01	Speed Washer
7-623-107-22	2.6 mm dia
7-623-203-27	Spring Washer, 3 mm dia
7-623-405-01	Star Washer, external 2 mm dia
7-624-118-01	Retaining Ring E-2.5

LUGS

7-623-507-01	Solder Lug, 2.6 mm dia
7-623-508-01	Solder Lug, 3 mm dia
1-451-039-20S	Deflection Yoke Ass'y, vidicon
X-20663-02	Bracket Ass'y, socket
2-042-306	Shield B, focus coil
2-042-307	Support
2-042-393	Corrugated Washer
2-044-820	Bracket, rear
2-044-828	Corrugated Washer
2-044-829	Spring, contact
2-044-831	Alignment Magnet
2-066-302	Nut
2-066-305	Nut, adjustment
2-070-301	Bracket, front, DY
2-070-302	Bracket B, front
2-070-303	Bracket, DY

ELECTRICAL PARTS LIST

Ref. No.	*Part No.*	*Description*

5-2. "H" BLOCK

8-984-024-20 Printed Circuit Board, with components

CAPACITORS

C301	1-105-673-12	0.01μF	±10%	50 V, mylar
C302	1-121-355-11	100μF	+100% −10%	12 V, electrolytic
C303	1-105-681-12	0.047μF	±10%	50 V, mylar
C304	1-105-669-12	0.0047μF	±10%	50 V, mylar
C305	1-105-681-12	0.047μF	±10%	50 V, mylar
C306	1-105-669-12	0.0047μF	±10%	50 V, mylar
C307	1-105-677-12	0.022μF	±10%	50 V, mylar
C308	1-105-677-12	0.022μF	±10%	50 V, mylar
C309	1-102-050-11	0.01μF	±20%	500 V, ceramic
C310	1-102-050-11	0.01μF	±20%	500 V, ceramic
C311	1-102-050-11	0.01μF	±20%	500 V, ceramic
C312	1-102-050-11	0.01μF	±20%	500 V, ceramic
C313	1-113-122-11	0.05μF	±20%	500 V, metalized paper
C314	1-113-122-11	0.05μF	±20%	500 V, metalized paper
C315	1-105-753-12	0.01μF	±10%	200 V, mylar
C316	1-121-148-11	1μF		100 V, electrolytic
C317	1-105-753-12	0.01μF	±10%	200 V, mylar
C318	1-121-148-11	1μF		100 V, electrolytic
C319	1-121-148-11	1μF		100 V, electrolytic

DIODES

D301	SF1
D302	SF1
D303	SF1
D304	SF1
D305	SF1
D306	SF1
D307	SF1

INDUCTORS

L301	1-407-191-21	470μH, micro
L302	1-407-169-11	100μH, micro
L303	1-407-177-11	470μH, micro

MULTIPLIER

MF1	8-749-910-70	MF-11-7

TRANSISTORS

Q301	2SC403A
Q302	2SC403A
Q303	2SC403A
Q304	2SC756
Q305	2SC756

Ref. No.	*Part No.*	*Description*

RESISTORS

(Resistors are carbon, fixed, 1/4W and ±5% unless otherwise noted.)

R301	1-242-697-11	10 kΩ
R302	1-242-673-11	1 kΩ
R303	1-242-681-11	2200 Ω
R304	1-242-681-11	2200 Ω
R305	1-242-704-11	20 kΩ
R306	1-242-681-11	2200 Ω
R307	1-242-697-11	10 kΩ
R308	1-242-649-11	100 Ω
R309	1-242-704-11	20 kΩ
R310	1-242-681-11	2200 Ω
R311	1-242-697-11	10 kΩ
R312	1-242-649-11	100 Ω
R313	1-242-699-11	12 kΩ
R314	1-242-699-11	12 kΩ
R315	1-242-673-11	1 kΩ
R316	1-242-697-11	10 kΩ
R317	1-242-673-11	1 kΩ
R318	1-242-737-11	470 kΩ
R319	1-242-721-11	100 kΩ
R320	1-242-737-11	470 kΩ
R321	1-221-351-11	600 kΩ, adjustable
R322	1-242-745-11	1 MΩ
R323	1-242-673-11	1 kΩ
R324	1-242-733-11	330 kΩ
R325	1-221-407-11	1 MΩ, adjustable
R326	1-242-723-11	120 kΩ
R327	1-242-609-11	2.2 Ω

TRANSFORMER

T301	1-441-348-12	Transformer, converter

MICRO MODULE

VF1	8-749-900-04	VF004

5-3. "P" BLOCK

8-984-024-10 Printed Circuit Board, with components

CAPACITORS

C201	1-105-725-12	0.1 μF	±10%	100 V, mylar
C202	1-105-725-12	0.1 μF	±10%	100 V, mylar
C204	1-121-476-11	22 μF	+100% −10%	6.3 V, electrolytic
C205	1-106-538-12	0.1 μF	±10%	35 V, mylar
C206	1-121-491-11	100 μF	+100% −10%	6.3 V, electrolytic
C207	1-121-355-11	100 μF	+100% −10%	12 V, electrolytic
C208	1-107-143-11	330 pF	±10%	50 V, mica

Ref. No.	Part No.	Description
C209	1-121-355-11	100 μF +100 -10% 12 V, electrolytic
C210	1-107-138-11	200 pF ±10% 50 V, mica
C211	1-121-126-11	10 μF 100 V, electrolytic
C212	1-121-355-11	100 μF +100 -10% 12 V, electrolytic
C213	1-121-491-11	100 μF +100 -10% 6.3 V, electrolytic
C214	1-106-538-12	0.1 μF ±10% 35 V, mylar
C215	1-121-483-11	33 μF +100 -10% 10 V, electrolytic
C216	1-105-681-12	0.047 μF ±10% 50 V, mylar
C217	1-121-355-11	100 μF +100 -10% 12 V, electrolytic
C218	1-121-491-11	100 μF +100 -10% 6.3 V, electrolytic
C219	1-121-442-11	1 μF +150 -10% 50 V, electrolytic
C220	1-121-442-11	1 μF +150 -10% 50 V, electrolytic
C221	1-129-127-31	680 pF ±10% 50 V, polyethylene
C222	1-105-677-12	0.022 μF ±10% 50 V, mylar
C223	1-105-677-12	0.022 μF ±10% 50 V, mylar
C224	1-106-538-12	0.1μF ±10% 35 V, mylar
C225	1-105-717-12	0.022 μF ±10% 100 V, mylar
C226	1-121-126-11	10 μF 100 V, electrolytic
C227	1-121-148-11	1 μF 100 V, electrolytic
C228	1-105-721-12	0.047 μF ±10% 100 V, mylar
C229	1-107-120-11	36 pF ±10% 50 V, mica
C230	1-107-111-11	15 pF ±10% 50 V, mica
C501	1-107-099-11	2 pF ±10% 50 V, mica

DIODES

D201		1T22A
D202		1T22A
D203		1T22A

INDUCTORS

L201	1-407-242-11	47 μH, micro
L202	1-407-159-11	15 μH, micro
L501		2.2 μH

TRANSISTORS

Q201		2SC710
Q202		2SC403A
Q203		2SA610
Q205		2SC403A
Q206		2SA610
Q207		2SC403A
Q208		2SC403A
Q209		2SA610
Q210		2SC403A
Q211		2SC805

RESISTORS

(Resistors are carbon, fixed, 1/4 W and ±5% unless otherwise noted.)

Ref. No.	Part No.	Description
R201	1-242-745-11	1 MΩ
R202	1-202-669-31	10 MΩ, 1/2 W, ±10%
R203	1-242-701-11	15 kΩ
R204	1-242-685-11	3300 Ω
R205	1-242-697-11	10 kΩ
R206	1-242-697-11	10 kΩ
R207	1-242-679-11	1800 Ω
R208	1-242-671-11	820 Ω
R209	1-242-660-11	300 Ω
R210	1-242-657-11	220 Ω
R211	1-242-665-11	470 Ω
R212	1-242-665-11	470 Ω
R213	1-242-691-11	5600 Ω
R215	1-242-659-11	270 Ω
R216	1-242-669-11	680 Ω
R217	1-242-649-11	100 Ω
R218	1-242-717-11	68 kΩ
R219	1-242-701-11	15 kΩ
R220	1-242-673-11	1 kΩ
R221	1-242-649-11	100 Ω
R222	1-242-649-11	100 Ω
R223	1-242-673-11	1 kΩ
R224	1-242-669-11	680 Ω
R225	1-242-663-11	390 Ω
R226	1-242-719-11	82 kΩ
R227	1-242-703-11	18 kΩ
R228	1-242-673-11	1 kΩ
R229	1-242-649-11	100 Ω
R230	1-242-655-11	180 Ω
R231	1-242-663-11	390 Ω
R232	1-242-665-11	470 Ω
R233	1-242-707-11	27 kΩ
R234	1-242-691-11	5600 Ω
R235	1-242-675-11	1200 Ω
R236	1-242-659-11	270 Ω
R237	1-242-745-11	1 MΩ
R238	1-242-745-11	1 MΩ
R239	1-242-685-11	3300 Ω
R240	1-242-681-11	2200 Ω
R242	1-242-757-11	3300 kΩ
R243	1-242-721-11	100 kΩ
R246	1-242-739-11	560 kΩ
R247	1-242-731-11	270 kΩ
R248	1-221-407-11	1 MΩ, adjustable
R249	1-242-731-11	270 kΩ
R250	1-242-721-11	100 kΩ

5-4. "D" BLOCK

8-984-024-30 Printed Circuit Board, with components

CAPACITORS

C1	1-105-685-12	0.1 μF ±10%	50 V, mylar
C2	1-121-442-11	1 μF +150 -10%	50 V, electrolytic

Ref. No.	Part No.	Description
C3	1-121-487-11	47 μF +100 −10% 6.3 V, electrolytic
C4	1-121-355-11	100 μF +100 −10% 12 V, electrolytic
C5	1-107-138-11	200 pF ±10% 50 V, mica
C6	1-121-442-11	1 μF +150 −10% 50 V, electrolytic
C7	1-121-801-11	47 μF +100 −10% 16 V, electrolytic
C8	1-129-131-11	1000 pF ±5% 50 V, polyethylene
C9	1-121-491-11	100 μF +100 −10% 6.3 V, electrolytic
C10	1-105-725-12	0.1 μF ±10% 100 V, mylar
C11	1-121-148-11	1 μF 100 V, electrolytic
C12	1-121-442-11	1 μF +150 −10% 50 V, electrolytic
C13	1-105-673-12	0.01 μF ±10% 50 V, mylar
C14	1-121-442-11	1 μF +150 −10% 50 V, electrolytic
C15	1-121-738-11	10 μF +100 −10% 50 V, electrolytic
C16	1-107-131-11	100 pF ±10% 50 V, mica
C17	1-107-138-11	200pF ±10% 50 V, mica
C18	1-105-685-12	0.1 μF ±10% 50 V, mylar
C19	1-105-673-12	0.01 μF ±10% 50 V, mylar
C20	1-121-442-11	1 μF +150 −10% 50 V, electrolytic
C21	1-127-024-11	2 μF ±20% 10 V, aluminum solid electrolytic
C22	1-121-701-11	20 μF ±20% 25 V, electrolytic
C23	1-121-421-11	220 μF +100 −10% 16 V, electrolytic
C24	1-121-476-11	22 μF +100 −10% 6.3 V, electrolytic
C25	1-121-476-11	22 μF +100 −10% 6.3 V, electrolytic
C26	1-121-442-11	1 μF +150 −10% 50 V, electrolytic
C27	1-127-024-11	2 μF ±20% 10 V, aluminum solid electrolytic
C28	1-121-491-11	100 μF +100 −10% 6.3 V, electrolytic
C29	1-127-024-11	2 μF ±20% 10 V, aluminum solid electrolytic
C30	1-121-476-11	22 μF +100 −10% 6.3 V, electrolytic
C31	1-121-476-11	22 μF +100 −10% 6.3 V, electrolytic
C32	1-121-491-11	100 μF +100 −10% 6.3 V, electrolytic
C33	1-107-138-11	200 pF ±10% 50 V, mica
C34	1-105-673-12	0.01 μF ±10% 50 V, mylar
C35	1-107-131-11	100 pF ±10% 50 V, mica
C36	1-105-677-12	0.022 μF ±10% 50 V, mylar
C37	1-105-679-12	0.033 μF ±10% 50 V, mylar
C38	1-121-472-11	10 μF +100 −10% 25 V, electrolytic
C39	1-105-673-12	0.01 μF ±10% 50 V, mylar
C40	1-105-745-12	0.0022 μF ±10% 200 V, mylar
C41	1-121-483-11	33 μF +100 −10% 10 V, electrolytic
C42	1-121-483-11	33 μF +100 −10% 10 V, electrolytic
C44	1-121-483-11	33 μF +100 −10% 10 V, electrolytic
C45	1-105-749-12	0.0047 μF ±10% 200 V, mylar
C46	1-121-487-11	47 μF +100 −10% 6.3 V, electrolytic
C47	1-105-673-12	0.01 μF ±10% 50 V, mylar
C48	1-121-415-11	100 μF +100 −10% 16 V, electrolytic
C49	1-105-677-12	0.022 μF ±10% 50 V, mylar
C50	1-121-355-11	100 μF +100 −10% 12 V, electrolytic
C52	1-101-439-11	680 pF +20 −0% 50 V, ceramic

DIODES

Ref. No.	Part No.	Description
D1		1T22
D2		1T22
D3		1T22
D4		SF1
D5		1T22
D6		1T22
D7		HFSD1A
D8		HFSD1A
D9		RD6A
D10		1T22
D11		1T22

INDUCTORS

Ref. No.	Part No.	Description
L1	1-407-177-11	470 μH, micro
L2	1-407-169-11	100 μH, micro
L3	1-407-169-11	100 μH, micro

TRANSISTORS

Ref. No.	Part No.	Description
Q1		2SC403A
Q2		2SA610
Q3		2SC403A
Q4		2SC352
Q5		2SC805
Q6		2SC403A
Q7		2SA611
Q8		2SB383
Q9		2SA610
Q10		2SC403A
Q11		2SC756
Q12		2SC403A
Q13		2SC756
Q14		2SA610
Q15		2SC403A
Q16		2SB383
Q17		2SC403A
Q18		2SC756
Q19		2SC756
Q21		2SD128A
Q22		2SC403A
Q23		2SC403A
Q24		2SC403A
Q25		2SC756

RESISTORS

(Resistors are carbon, fixed, 1/4 W and ±5% unless otherwise noted.)

Ref. No.	Part No.	Description
R1	1-242-697-11	10 kΩ
R2	1-242-684-11	3 kΩ
R3	1-242-681-11	2200 Ω
R4	1-242-673-11	1 kΩ
R5	1-242-670-11	750 Ω
R6	1-242-697-11	10 kΩ
R7	1-242-705-11	22 kΩ
R8	1-242-641-11	47 Ω

Ref. No.	Part No.	Description
R9	1-221-602-11	1 kΩ, adjustable
R10	1-242-693-11	6800 Ω
R11	1-242-697-11	10 kΩ
R12	1-242-673-11	1 kΩ
R13	1-242-691-11	5600 Ω
R14	1-242-657-11	220 Ω
R15	1-242-673-11	1 kΩ
R16	1-242-685-11	3300 Ω
R17	1-242-737-11	470 kΩ
R18	1-221-351-11	600 kΩ, adjustable
R20	1-242-703-11	18 kΩ
R21	1-242-689-11	4700 Ω
R23	1-242-681-11	2200 Ω
R24	1-242-705-11	22 kΩ
R25	1-242-705-11	22 kΩ
R26	1-242-691-11	5600 Ω
R27	1-242-705-11	22 kΩ
R28	1-242-673-11	1 kΩ
R29	1-242-709-11	33 kΩ
R30	1-242-673-11	1 kΩ
R31	1-242-673-11	1 kΩ
R32	1-221-603-11	2 kΩ, adjustable
R33	1-242-687-11	3900 Ω
R34	1-242-691-11	5600 Ω
R35	1-242-685-11	3300 Ω
R36	1-242-673-11	1 kΩ
R37	1-242-673-11	1 kΩ
R38	1-242-709-11	33 kΩ
R39	1-242-689-11	4700 Ω
R40	1-242-673-11	1 kΩ
R41	1-221-468-11	100 Ω, adjustable
R42	1-242-689-11	4700 Ω
R43	1-221-605-11	10 kΩ, adjustable
R44	1-242-689-11	4700 Ω
R45	1-242-672-11	910 Ω
R46	1-242-661-11	330 Ω
R47	1-202-549-11	100 Ω, 1/2 W
R48	1-242-625-11	10 Ω
R49	1-242-685-11	3300 Ω
R50	1-242-677-11	1500 Ω
R51	1-221-605-11	10 kΩ, adjustable
R52	1-242-665-11	470 Ω
R53	1-221-604-11	5 kΩ, adjustable
R54	1-242-709-11	33 kΩ
R55	1-242-689-11	4700 Ω
R56	1-242-680-11	2 kΩ
R57	1-221-468-11	100 Ω, adjustable
R58	1-221-604-11	5 kΩ, adjustable
R59	1-242-687-11	3900 Ω
R60	1-242-671-11	820 Ω
R61	1-242-665-11	470 Ω
R62	1-242-617-11	4.7 Ω
R63	1-242-703-11	18 kΩ
R64	1-242-697-11	10 kΩ
R65	1-242-691-11	5600 Ω
R66	1-242-697-11	10 kΩ
R67	1-242-673-11	1 kΩ
R68	1-242-709-11	33 kΩ
R69	1-242-689-11	4700 Ω
R70	1-242-673-11	1 kΩ
R71	1-221-603-11	2 kΩ, adjustable
R72	1-242-691-11	5600 Ω
R73	1-242-679-11	1800 Ω
R74	1-242-673-11	1 kΩ
R75	1-242-675-11	1200 Ω
R76	1-242-663-11	390 Ω
R77	1-242-653-11	150 Ω
R78	1-242-657-11	220 Ω
R79	1-242-671-11	820 Ω
R80	1-242-627-11	12 Ω
R81	1-242-633-11	22 Ω
R82	1-202-533-11	22 Ω, 1/2 W
R83	1-242-611-11	2.7 Ω
R84	1-221-468-11	100 Ω, adjustable
R85	1-242-615-11	3.9 Ω
R86	1-242-681-11	2200 Ω
R87	1-242-665-11	470 Ω
R88	1-242-620-11	6.2 Ω
R89	1-242-633-11	22 Ω
R90	1-204-528-11	1 Ω, 1 / 2 W
R91	1-242-745-11	1 MΩ
R92	1-242-685-11	3300 Ω
R93	1-242-711-11	39 kΩ
R94	1-242-690-11	5100 Ω
R95	1-242-663-11	390 Ω
R96	1-242-675-11	1200 Ω
R97	1-221-693-11	1 kΩ, adjustable
R98	1-242-685-11	3300 Ω
R99	1-242-697-11	10 kΩ
R100	1-242-677-11	1500 Ω
R101	1-242-643-11	56 Ω
R102	1-242-670-11	750 Ω
R103	1-242-625-11	10 Ω
R104	1-242-659-11	270 Ω
R105	1-242-690-11	5100 Ω
R106	1-242-691-11	5600 Ω
R107	1-242-667-11	560 Ω
R108	1-242-705-11	22 kΩ
R110	1-242-615-11	3.9 Ω

TRANSFORMERS

T1	1-435-008-11	Transformer, vertical blocking
T2	1-421-203-11	Coil, vertical dummy choke
T3	1-435-010-11	Transformer, horizontal blocking
T4	1-435-009-11	Transformer, horizontal drive
T5	1-439-042-11	Transformer, horizontal flyback for vidicon
T6	1-407-352-11	Coil, horizontal dummy choke
T7	1-439-043-11	Transformer, horizontal flyback for view finder

Ref. No.	*Part No.*	*Description*
	THERMISTORS	
TH1	8-690-005-00	S-300
TH2	8-690-005-00	S-300
	1-506-108-11	Terminal, Pin

5-5. "M" BLOCK

Printed Circuit Board, with component

CAPACITORS

C401	1-121-355-11	100 μF	$^{+100}_{-10}$%	12 V, electrolytic
C402	1-121-442-11	1 μF	$^{+150}_{-10}$%	50 V, electrolytic

RESISTORS

R401	1-242-686-11	3600 Ω, 1/4 W, ±5%	
R402	1-242-686-11	3600 Ω, 1/4 W, ±5%	
R403	1-242-679-11	1800 Ω, 1/4 W, ±5%	

Ref. No.	*Part No.*	*Description*

5-6. FRAME

CAPACITORS

1-121-472-11	10 μF	$^{+100}_{-10}$ %	25 V, electrolytic
1-107-099-11	2 pF	±10%, silvered mica	

TRANSISTORS

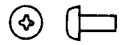
Q20	2SD28

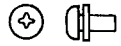
MISCELLANEOUS

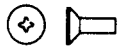
8-730-101-00	Cathode Ray Tube, view finder
8-814-190-21	Microphone, ELECTRET
1-407-220-11	Inductor, 2.2 μH
1-451-039-20S	Coil Ass'y, vidicon camera
1-451-040-14	Deflection Yoke, view finder
1-452-026-13	Magnet, focus
1-452-027-11	Ring, focus
1-513-149-00	Switch, push
1-518-069-12	Miniature Lamp, 25 mA
1-525-206-11	Vidicon
1-526-081-15	CRT Socket
1-534-589-13	Camera Cable
1-536-047-11	Terminal Pin
1-107-099-11	2 pF ±10%, mica

SECTION 6
EXPLODED VIEWS WITH PARTS NUMBERS

—— Hardware Nomenclature ——

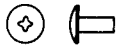
P – Pan Head Screw . . . . . 

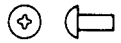
PS – Pan Head Screw with Spring Washer . . . . . 

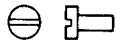
K – Flat Countersunk Head Screw . . . 

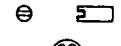
B – Binding Head Screw . . . . .

RK – Oval Countersunk Head Screw . .

T – Truss Head Screw . . . . . 

R – Round Head Screw . . . . . 

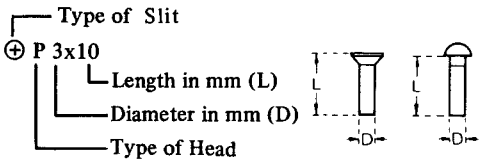
F – Flat Fillister Head Screw . . . . . 

SC – Set Screw . . . . . 

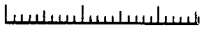
E – Retaining Ring (E Washer) . . . . .

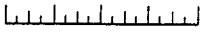
W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

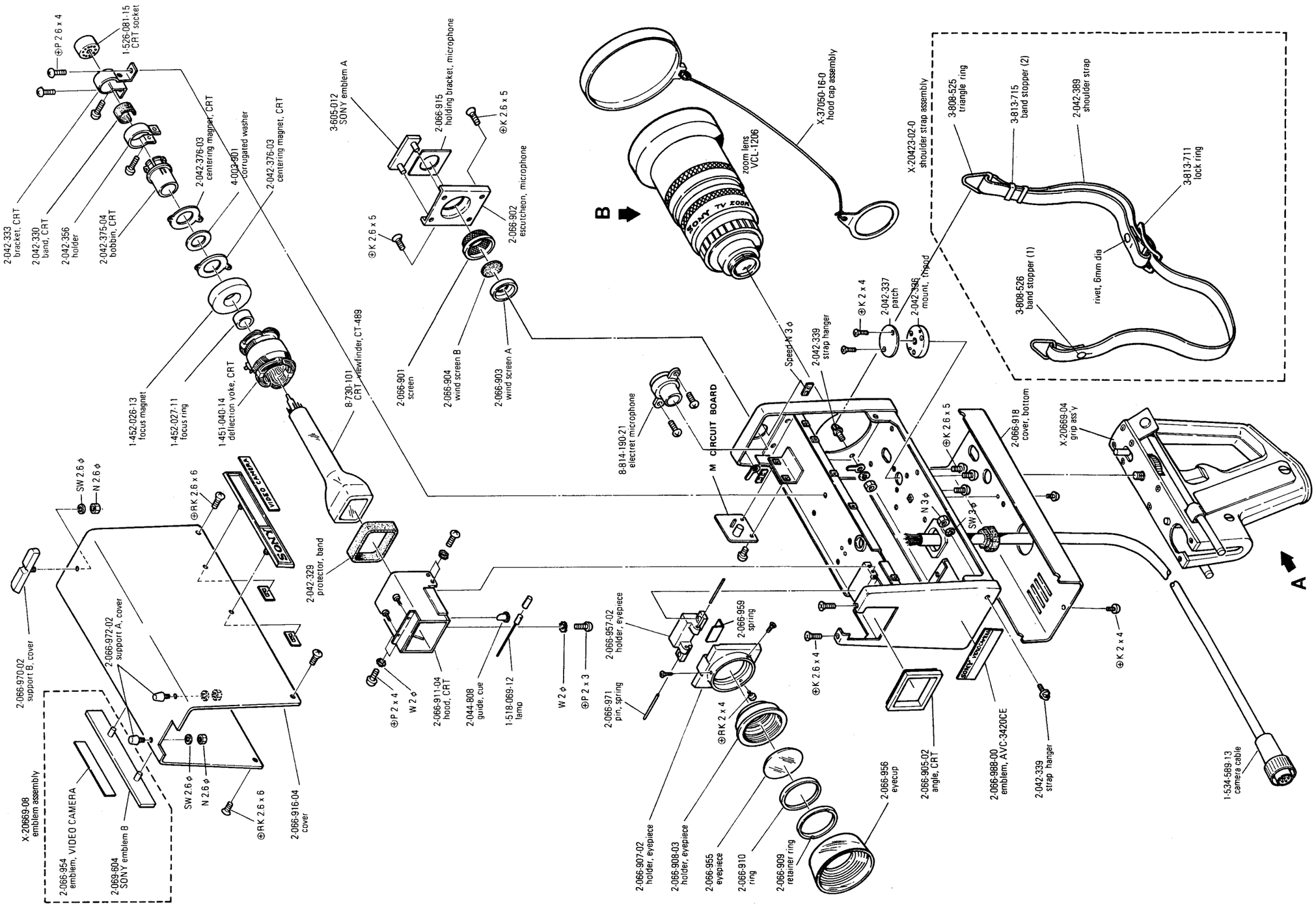


All screws conform to ISO standards, unless otherwise noted

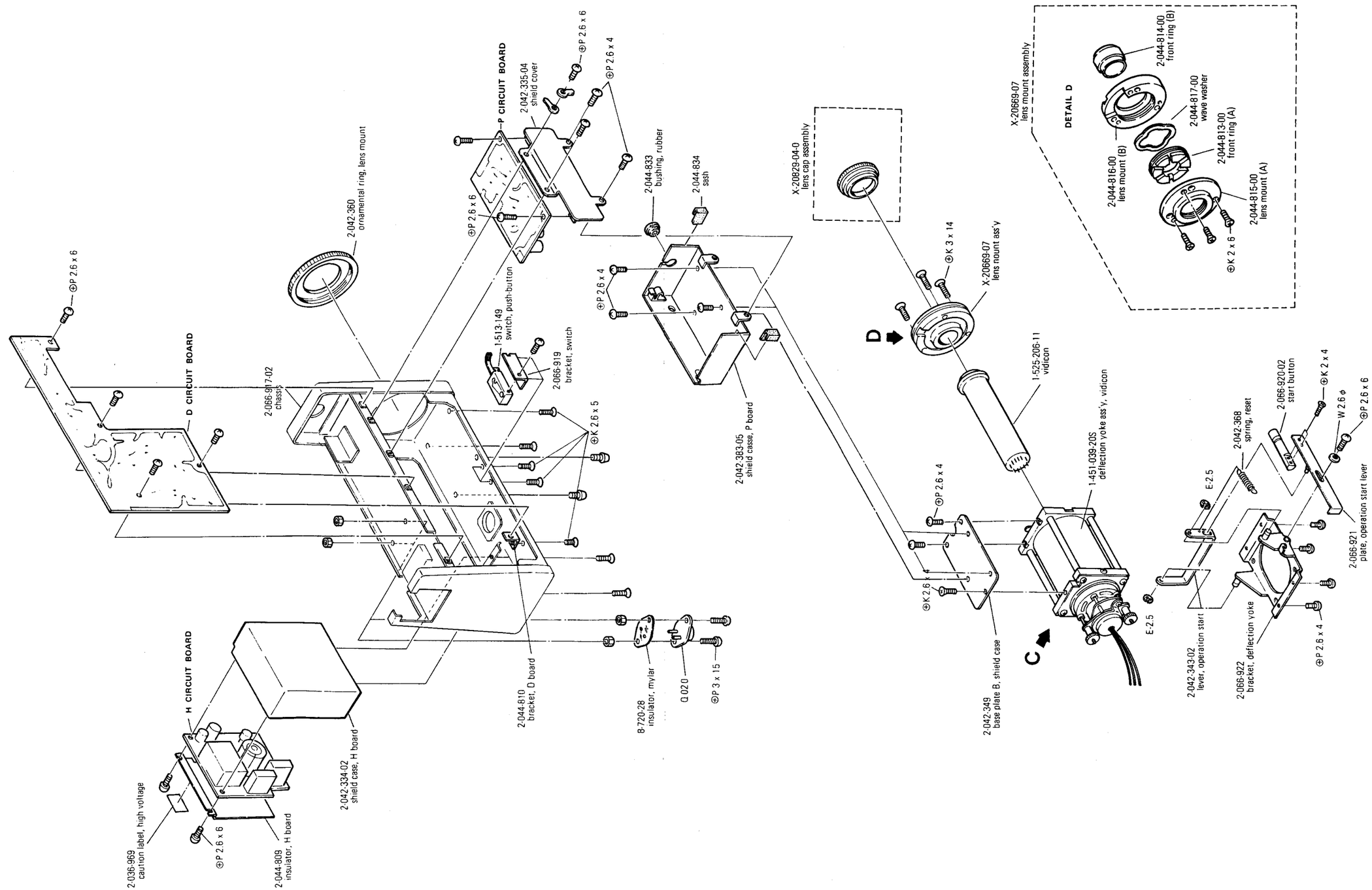
Scale:  25.4 millimeters

 1 inch

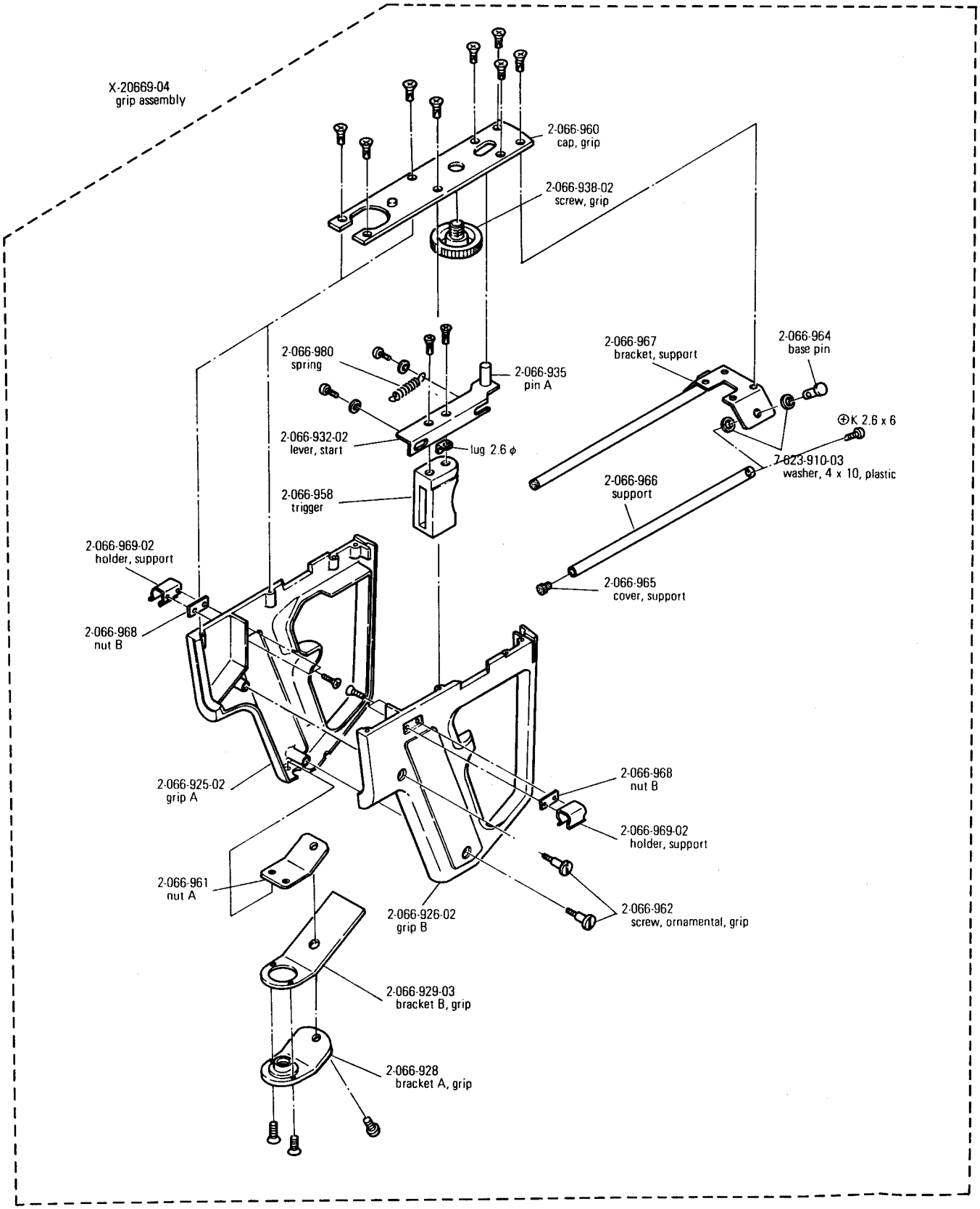
6-1. CHASSIS, VIEW FINDER AND OTHERS EXPLODED VIEW



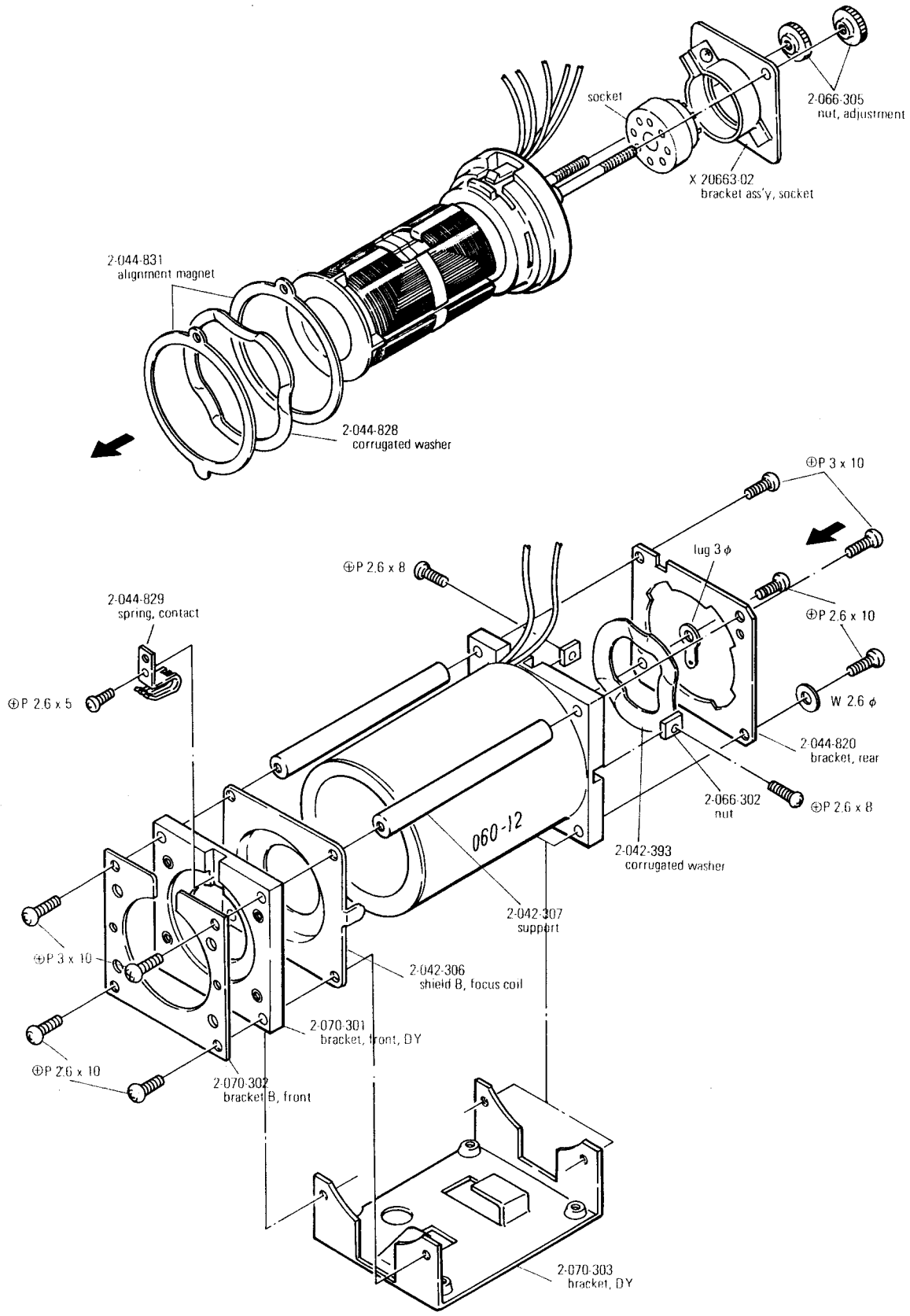
6-2. VIDICON COIL ASS'Y AND PRINTED CIRCUIT BOARDS EXPLODED VIEW



6-3. GLIP HANDLE ASS'Y EXPLODED VIEW – DETAIL A



6-4. DEFLECTION YOKE ASS'Y EXPLODED VIEW – DETAIL C.



6-5. SCREWS, WASHERS AND OTHERS PARTS LIST

Part No.	*Description*
	Screws
7-621-255-22	(+) P 2 x 4
7-621-259-22	(+) P 2.6 x 4
7-621-259-42	(+) P 2.6 x 6
7-621-259-52	(+) P 2.6 x 8
7-621-261-52	(+) P 3 x 8
7-621-555-22	(+) K 2 x 4
7-621-559-22	(+) K 2.6 x 4
7-621-559-38	(+) K 2.6 x 5
7-621-559-49	(+) K 2.6 x 6
7-621-561-82	(+) K 3 x 14
7-621-655-38	(+) RK 2 x 5
7-621-659-46	(+) RK 2.6 x 6
7-621-721-73	(+) K 2.6 x 6, tapping

Part No.	*Description*
	Nut
7-622-108-02	3 mm dia
	Washers
7-622-408-01	Speed Washer
7-623-107-22	2.6 mm dia
7-623-203-27	Spring Washer, 3 mm dia
7-623-405-01	Star Washer, external 2 mm dia
7-624-118-01	Retaining Ring E-2.5
	Lugs
7-623-507-01	Terminal Lug, 2.6 mm dia
7-623-508-01	Terminal Lug, 3 mm dia

SONY®
SERVICE MANUAL

VIDEO CAMERA
AVC-3420CE

No. 1
November, 1974

SUPPLEMENT

SUBJECT : "H" BOARD PATTERN CHANGE

The supplement up dates the AVC-3400 Service Manual.
The printed pattern of the "H" board has been changed in all units bearing Serial number listed below. Only the pattern is changed; circuit board adjustment procedures remain the same.

AVC-3420CE AEP ; Serial No. 11,901 and higher
AVC-3420CE UK ; Serial No. 10,201 and higher

SONY CORPORATION

9-966-121-81

1979.2 0909-5
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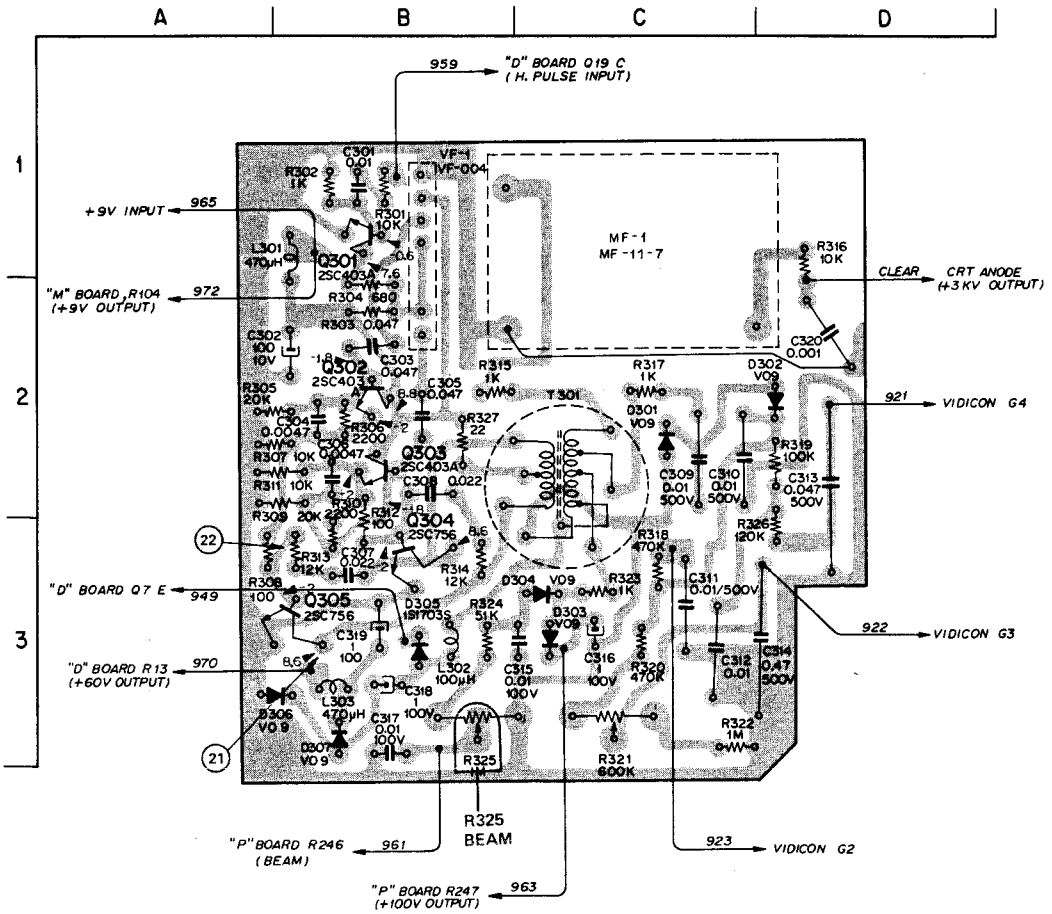
H BOARD



Q301	B	1
Q302	B	2
Q303	B	2
Q304	B	3
Q305	B	3
D301	C	2
D302	D	2
D303	C	3
D304	C	3
D305	B	3
D306	B	3
D307	B	3

VCL-1206

ZOOM LENS

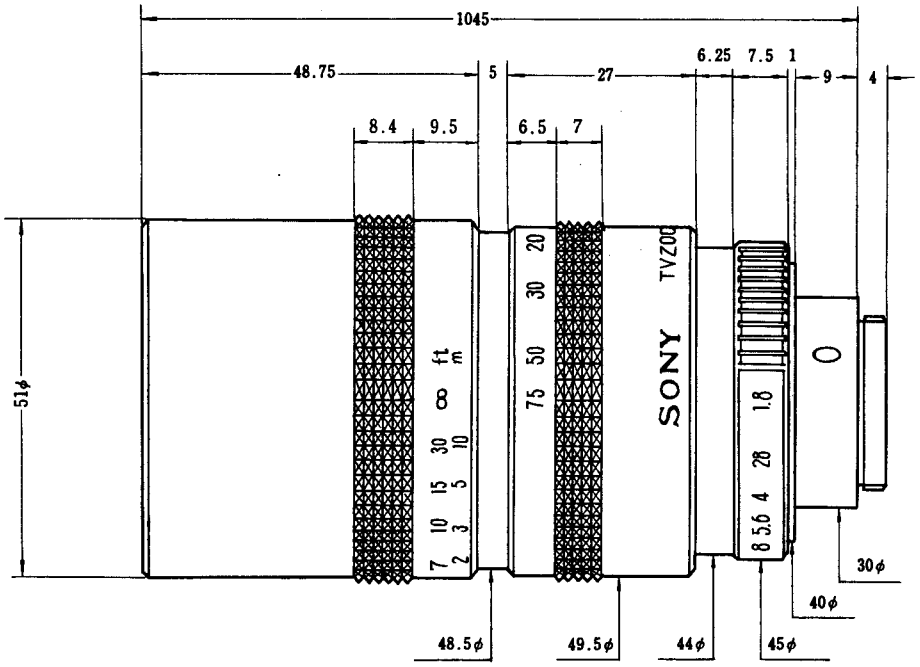
SPECIFICATIONS

Applications:	SONY AVC-3200 series video cameras, AVC-3400, 3420CE and other 2/3 inch vidicon cameras
Focal Length:	12.5 mm~75 mm
Maximum Relative Aperture:	f1.8
Mount:	C mount
f-stop Calibrations:	f1.8, 2.8, 4, 5.6, 8, 11, 16, and closed
Zoom Ratio:	6 : 1
Angular Field of View:	Horizontal, 34.5°~5.7° Vertical, 25.8°~4.8°
Minimum Distance between Lens and Object:	40 inches (1 meter)
Weight:	13 oz (380g)

SONY®

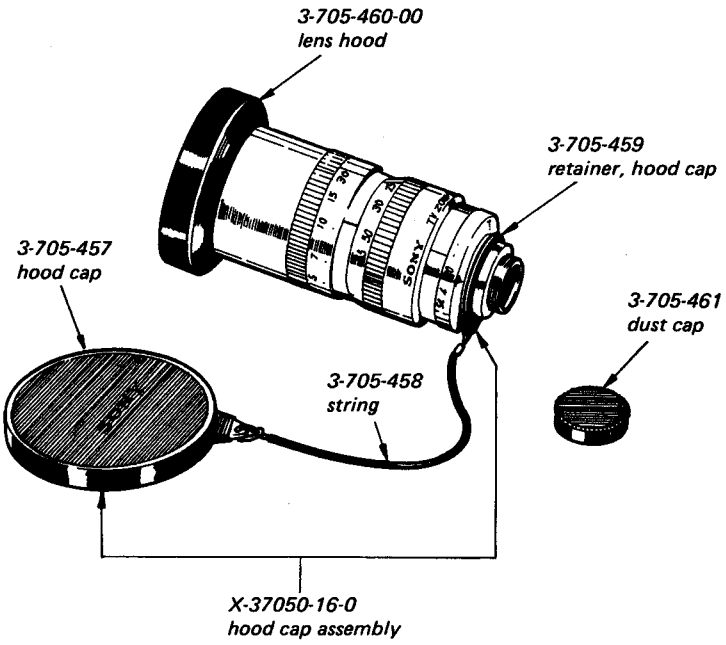
SERVICE MANUAL

DIMENSIONS (in millimeters):

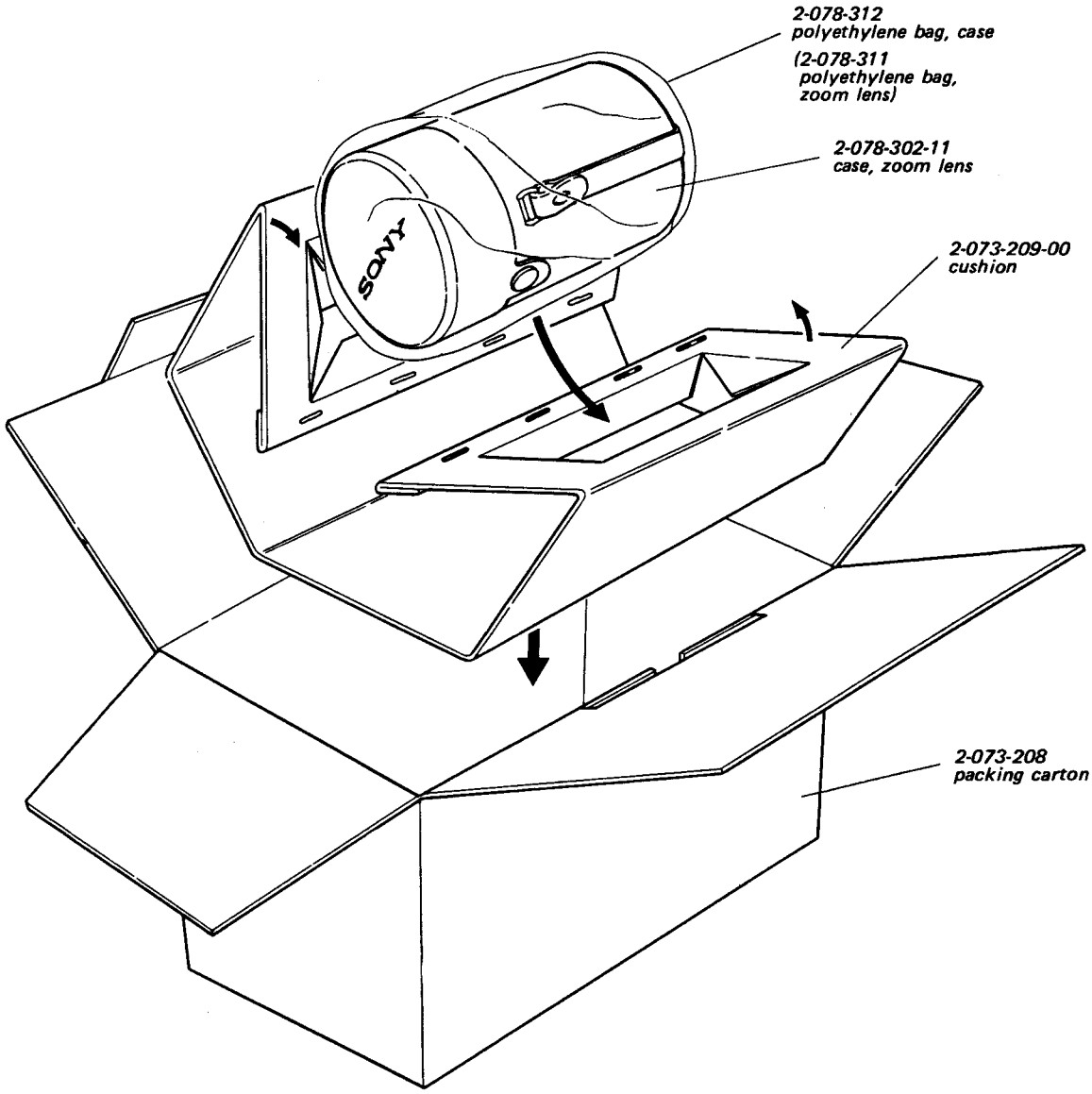


note: φ = diameter in millimeters

EXTERNAL VIEW:



PACKING


2-078-312
polyethylene bag, case
(2-078-311
polyethylene bag,
zoom lens)
2-078-302-11
case, zoom lens
2-073-209-00
cushion
2-073-208
packing carton
SONY